



# SEQUENCE LISTING

<110> Osteryoung, Katherine W.  
Vitha, Stanislav  
Koksharova, Olga A.  
Gao, Hongo

<120> Plastid Division and Related Genes and Proteins, and Methods of Use

<130> MSU-08153

<140> 10/600,070

<141> 2003-06-20

<160> 206

<170> PatentIn version 3.2

<210> 1

<211> 2406

<212> DNA

<213> Arabidopsis thaliana

<400> 1  
atggaagctc tgagtcacgt cggcattggt ctctcccat tccaattatg ccgattacca 60  
ccggcgacga caaagctccg acgtagccac aacacctcta caactatctg ctccgccagc 120  
aaatgggccc accgtcttct ctccgacttc aatttcacct ccgattcctc ctctcctcc 180  
ttcgccaccg ccaccaccac cgccactctc gtctctctgc caccatctat tgatcgctcc 240  
gaacgccacg tccccatccc cattgatttc taccaggtat taggagctca aacacatttc 300  
ttaaccgatg gaatcagaag agcattcgaa gctagggttt cgaaaccgcc gcaattcggt 360  
ttcagcgacg acgctttaat cagccggaga cagattcttc aagctgcttg cgaaactctg 420  
tctaactctc ggtctagaag agagtacaat gaaggctctc ttgatgatga agaagctaca 480  
gtcatcactg atgttccttg ggataagggt cctggggctc tctgtgtatt gcaagaagg 540  
ggtagagactg agatagttct tcgggttggt gaggtctctgc ttaaggagag gttgcctaag 600  
tcgtttaagc aagatgtggt tttagttatg gcgcttgctt ttctcgatgt ctcgagggat 660  
gctatggcat tggatccacc tgattttatt actggttatg agtttggtga ggaagctttg 720  
aagcttttac aggaggaagg agcaagtagc cttgcaccgg atttacgtgc acaaattgat 780  
gagactttgg aagagatcac tccgcgttat gtcttgagc tacttggtt accgcttggt 840  
gatgattacg ctgcgaaaag actaaatggt ttaagcgggtg tgcggaatat tttgtggtct 900  
gttgaggag gtggagcatc agctcttggt ggggggttga cccgtgagaa gtttatgaat 960  
gaggcgtttt tacgaatgac agctgctgag cagggtgatc tttttgtagc taccccaagc 1020  
aatattccag cagagtcatt tgaagtttac gaagttgcac ttgctcttgt ggctcaagct 1080  
tttattggta agaagccaca ctttttacg gatgctgata agcaattcca gcaacttcag 1140

caggctaagg taatggctat ggagattcct gcgatgttgt atgatacacg gaataattgg	1200
gagatagact tccgtctaga aaggggactc tgtgcactgc ttataggcaa agttgatgaa	1260
tgccgtatgt ggttgggctt agacagtgag gattcacaat ataggaatcc agctattgtg	1320
gagtttgttt tggagaattc aaatcgtgat gacaatgatg atctccctgg actatgcaaa	1380
ttgttgaaaa cctgggtggc aggggttgtc tttcctaggt tcagagacac caaagataaa	1440
aaatttaaac tccggggacta ctatgatgat cctatggttt tgagttactt ggaaagagtg	1500
gaggtagttc agggttctcc tttagctgct gctgcaacta tggcaaggat tggagccgag	1560
catgtgaaaag ctagtgcctat gcaggcactg cagaaaagttt ttccttcccc ctatacagat	1620
agaaactcgg ctgaacccaa ggatgtgcaa gagacagtgt ttagtgtaga tcctgttggt	1680
aacaatgtag gccgtgatgg tgagcctggg gtctttattg cagaagctgt aagaccctct	1740
gaaaactttg aaactaatga ttatgcaatt cgagctgggg tctcagagag tagcgttgat	1800
gaaactactg ttgaaatgtc cgttgctgat atgttaaagg aggcaagtgt gaagatccta	1860
gctgctgggtg tggcaattgg actgatttca ctgttcagcc agaagtattt tcttaaaagc	1920
agctcatctt ttcaacgcaa ggatatgggt tcttctatgg aatctgatgt cgctaccata	1980
gggtcagtca gagctgacga ttcagaagca cttcccagaa tggatgctag gactgcagag	2040
aatatagtat ccaagtggca gaagattaag tctctggctt ttgggcctga tcaccgcata	2100
gaaatgttac cagagggttt ggatggggcga atgctgaaga tttggactga cagagcagct	2160
gaaactgcgc agcttgggtt ggtttatgat tatacactgt tgaaactatc tgttgacagt	2220
gtgacagtct cagcagatgg aaccctgtgt ctggtggaag caactctgga ggagtctgct	2280
tgtctatctg atttgggttca tccagaaaac aatgctactg atgtcagaac ctacacaaca	2340
agatacgaag ttttctgggtc caagtcaggg tggaaaatca ctgaaggctc tgttcttgca	2400
tcataa	2406

<210> 2  
 <211> 801  
 <212> PRT  
 <213> Arabidopsis thaliana  
  
 <400> 2

Met	Glu	Ala	Leu	Ser	His	Val	Gly	Ile	Gly	Leu	Ser	Pro	Phe	Gln	Leu
1				5					10					15	

Cys	Arg	Leu	Pro	Pro	Ala	Thr	Thr	Lys	Leu	Arg	Arg	Ser	His	Asn	Thr
			20					25					30		

Ser	Thr	Thr	Ile	Cys	Ser	Ala	Ser	Lys	Trp	Ala	Asp	Arg	Leu	Leu	Ser
		35					40					45			

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Ser Phe Ala Thr Ala  
 50 55 60

Thr Thr Thr Ala Thr Leu Val Ser Leu Pro Pro Ser Ile Asp Arg Pro  
 65 70 75 80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala  
 85 90 95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg  
 100 105 110

Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser  
 115 120 125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg  
 130 135 140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr  
 145 150 155 160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val  
 165 170 175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala  
 180 185 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu  
 195 200 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu  
 210 215 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu  
 225 230 235 240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg  
 245 250 255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu  
 260 265 270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu  
 275 280 285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly

290	295	300
Gly Ala Ser Ala Leu Val 305	Gly Gly Leu Thr 310	Arg Glu Lys Phe Met Asn 315 320
Glu Ala Phe Leu Arg Met Thr Ala Ala 325	Glu Gln Val Asp Leu Phe Val 330 335	
Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val 340 345 350		
Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu 355 360 365		
Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val 370 375 380		
Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp 385 390 395 400		
Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly 405 410 415		
Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser 420 425 430		
Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn 435 440 445		
Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr 450 455 460		
Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys 465 470 475 480		
Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr 485 490 495		
Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala Ala 500 505 510		
Thr Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln 515 520 525		
Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala 530 535 540		

Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly  
 545 550 555 560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala  
 565 570 575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala  
 580 585 590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val  
 595 600 605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val  
 610 615 620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser  
 625 630 635 640

Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp  
 645 650 655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro  
 660 665 670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys  
 675 680 685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro  
 690 695 700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala  
 705 710 715 720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu  
 725 730 735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val  
 740 745 750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro  
 755 760 765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val  
 770 775 780

Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala  
 785 790 795 800

Ser

<210> 3  
<211> 3667  
<212> DNA  
<213> Arabidopsis thaliana

<400> 3  
tggtctgcat taaggagaat acaattataa gcaatttgct ttgatttcaa caagattttg 60  
cttggctata ggattcattg gctctgtttg cttttacatt tacatgtcat aatagtttcg 120  
aattttacac atttcagttg gatgttaaga aaagagaggg aattgatggg gttttgtggg 180  
tttaaacttt aaagtagtca agaattaagt cattggttta ctgttgctct atatgtgtaa 240  
aatgaaggca actccaacgg ttcttaggtg gaatagatta tttagacgat ttaacatcat 300  
aaagtccgtg gcgactgtaa catcatagat tgttttttat ttttttcagt agctgggtgat 360  
gttttttgat ttaacttata ctactcaaaa tcaaaattcc ataaacccta gacgacaaaa 420  
cagtctcttc aatatgtaaa acagaacaaa gttttttag tagcctaaaa agacactccc 480  
atggaagctc tgagtcacgt cggcattggt ctctcccat tccaattatg ccgattacca 540  
ccggcgacga caaagctccg acgtagccac aacacctcta caactatctg ctccgccagc 600  
aaatggggccg accgtcttct ctccgacttc aatttcacct ccgattcctc ctctcctcc 660  
ttcgccaccg ccaccaccac cgccactctc gtctctctgc caccatctat tgatcgctcc 720  
gaacgccacg tccccatccc cattgatttc taccagggtat taggagctca aacacatttc 780  
ttaaccgatg gaatcagaag agcattcgaa gctagggttt cgaaaccgcc gcaattcggt 840  
ttcagcgacg acgctttaat cagccggaga cagattcttc aagctgcttg cgaaactctg 900  
tctaatcctc ggtctagaag agagtacaat gaaggctctc ttgatgatga agaagctaca 960  
gtcatcactg atgttccttg ggataaggta atttcgattt cggaataata aagtttcttc 1020  
gttttaattt catgaattgg ataaaggaag gaacttttat ctagtgaagg ttcttggggc 1080  
tctctgtgta ttgcaagaag gtggtgagac tgagatagtt cttcgggttg gtgaggctct 1140  
gcttaaggag aggttgctta agtcgtttta gcaagatgtg gtttttagtta tggcgcttgc 1200  
gtttctcgat gtctcgaggg atgctatggc attggatcca cctgatttta ttactggtta 1260  
tgagtttggt gaggaagctt tgaagctttt acaggtagtt tgacttgctt tggtaatttg 1320  
acgagcgttg gctttataag aactttcttg atttgatact ttgttattga gtcttgtgta 1380  
ggaggaagga gcaagtagcc ttgcaccgga ttacgtgca caaattgatg agactttgga 1440  
agagatcact ccgcgttatg tcttgagct acttggttga ccgcttggtg atgattacgc 1500  
tgcgaaaaga ctaaatgggt taagcggtgt gcggaatatt ttgtggctctg ttggaggagg 1560

tggagcatca gctcttgttg ggggtttgac ccgtgagaag tttatgaatg aggcgttttt	1620
acgaatgaca gctgctgagc aggtatacag tttagatacc tttttttaat ttcttttagca	1680
tgatataact ttaggtttct cattttaatg tatgttgtgt ggtaggttga tctttttgta	1740
gctaccccaa gcaatattcc agcagagtca tttgaagttt acgaagttgc acttgctctt	1800
gtggctcaag cttttatttg taagaagcca caccttttac aggatgctga taagcaattc	1860
cagcaacttc agcaggctaa ggtaatggct atggagattc ctgcatgtt gtatgataca	1920
cggaataatt gggagataga cttcgggtcta gaaaggggac tctgtgcact gcttataggc	1980
aaagttgatg aatgccgtat gtggttgggc ttagacagtg aggattcaca atataggaat	2040
ccagctattg tggagtttgt tttggagaat tcaaactgtg atgacaatga tgatctccct	2100
ggactatgca aattgttggg aacctggttg gcaggggttg tctttcctag gttcagagac	2160
accaaagata aaaaatttaa actcggggac tactatgatg atcctatggg tttgagttac	2220
ttggaaagag tggaggtagt tcagggttct ctttagctg ctgctgcaac tatggcaagg	2280
attggagccg agcatgtgaa agctagtgtc atgcaggcac tgcagaaagt ttttccttc	2340
cgctatacag atagaaactc ggctgaaccc aaggatgtgc aagagacagt gtttagtgta	2400
gatcctgttg gtaacaatgt aggccgtgat ggtgagcctg gtgtctttat tgcagaagct	2460
gtaagaccct ctgaaaactt tgaaactaat gattatgcaa ttcgagctgg ggtctcagag	2520
agtagcgttg atgaaactac tgttgaaatg tccgttgctg atatgttaaa ggaggcaagt	2580
gtgaagatcc tagctgctgg tgtggcaatt ggactgattt cactgttcag ccagaagtat	2640
tttcttaaaa gcagctcatc ttttcaacgc aaggatatgg tttcttctat ggaatctgat	2700
gtcgtacca taggtatgat taaatgatgc aattttcata tatctgcatt gctcaaaata	2760
tgcttgtttt gtgagctaag aacatagttc ccacttaata catgtcccaa aagttgtacc	2820
aagattaaca agttgctgag taaatttcac taattatgct gcttgaattt tttgatcaaa	2880
ctgtagacag aaatgtaaat ttcactctca acatttctgt ttagaataac gtaggattag	2940
agattgcctt agtgtggctt tgtccaactt ttctttcctt gatttttttc ttttcgattt	3000
agggtcagtc agagctgacg attcagaagc acttcccaga atggatgcta ggactgcaga	3060
gaatatagta tccaagtggc agaagattaa gtctctggct tttgggcctg atcaccgcat	3120
agaaatgtta ccagaggatga ggaataaat ctacaattca atcaattgtg tgaaaactgt	3180
tggacatgat tatagtctgg tgccttgttt gattctgtta tttatagggt ttggatgggc	3240
gaatgctgaa gatttggact gacagagcag ctgaaaactgc gcagcttggg ttggtttatg	3300
attatacact gttgaaacta tctgttgaca gtgtgacagt ctcagcagat ggaaccctg	3360
ctctgggtgga agcaactctg gaggagtctg cttgtctatc tgatttgggt catccagaaa	3420

acaatgctac tgatgtcaga acctacacaa caagatacga agttttctgg tccaagtcag	3480
ggtggaaaat cactgaaggc tctgttcttg catcataata tactcatatg tagcatgtct	3540
gagcttgca gattctcttt gttctgtaaa ttctctctct aagttagtgt ttataaatga	3600
acacaaaaaa attaacgttc ttggcacacc cttttccttg atctaaacta taacataagg	3660
gctacaa	3667

<210> 4  
 <211> 2469  
 <212> DNA  
 <213> Synechococcus PCC7942

<400> 4	
cttgccgact aaaggctaag catcgccatt ccttagatta aagcagtctg tcggcggcgc	60
tgtgccggtt aacaccagtc tgtcgctgac agcggcgcct ttctggggct tgcctgtggg	120
gcgagtaacc gatcgctggg ataagagttg gtgcttctgg ctctcaagaa tagggttttc	180
cgtcgcgtat tcccgatcac atccccctgt gtctgctacg gagataacgc cgatcactca	240
acagaattgg taagttgacg gtcaagttgg gatgatgaag tcggctcaag ctggcgatcc	300
ggatctggtg ggtgttctgt gcgtattcct ctcgattact accgaattct ctgtgttggc	360
gtgcaagcct cggcagacaa acttgccgaa agctaccgcg atcgccctcaa ccaatcgccc	420
tcccatgagt tttcagagct ggcatcgag gcgcggcggc aactcctcga agcagcgatt	480
gctgagctga gtgatcccga acagcgcgat cgctacgatc gccgcttttt tcagggcggg	540
ctggaagcga ttgaaccaag cctagaactc gaagactggc agcgaattgg agccctgctg	600
atcctgctgg aattggggga atacgatcgc gtttcgcaac tggctgagga actcctgcc	660
gactacgacg cgagcgcaga agtacgcgat cagttcgcg gcgggtgatat cgccttggcg	720
atcgccactat cccagcaatc cctcggtcga gaatgccgtc agcaggggtct gtacgaacag	780
gccgcccagc actttggccg cagccagtct gccctagccg atcatcagcg ctttcctgaa	840
ctgagtcgaa ccctgcacca agaacaagga cagctacggc cctatcgcat tttggagcgg	900
ttggcccagc ccttgactgc cgatagcgat cgccagcagg gtttgctgtt gttgcaggcg	960
atgttgagcg accggcaggg cattgaaggc cctggggatg atggctcggg gctgaccctt	1020
gataactttt tgatgtttct ccagcaaatt cgcggtatc tgaccctggc tgaacagcag	1080
ttgctgtttg aatcggaagc gcgtcggccc tcgccggctg cgagcttttt tgctgtctac	1140
accctgattg cgcggggctt ttgcgatcac caaccctcgt tgatccatcg cgccagcttg	1200
ctcttgcatg aactcaagag ccgcatggat gtgcacatcg aacaggcgat cgccagccta	1260
ttgctcggac agcccgaaga agctgaggcg ctactcgtcc agagccaaga tgaggaaacc	1320
ctcagccaaa tccgtgcctt agcccaaggg gaagccctga tcgtcggttt gtgccgattc	1380



acggaacct ggctagcgac caaggtatth ccggtatthcc gcgacctcaa ggaaaggact 1440  
 gcgccgctgc agccctactt tgacgacccc gatgtccaga cctatctgga tgcgatcgtg 1500  
 gagttgccgt ccgatttgat gccaacgccg ctaccctgtg agccgcttga ggtgcgatcg 1560  
 tcgttgctgg ccaaggaact gccgacccca gcaacgcctg gtgtagctcc accccctcgc 1620  
 cgccgtcgcc gcgatcgctc cgaacgtcct gtcgcacagg ccaaacgctt gcccttgccc 1680  
 tggattgggt tgggggttgt ggtggttctc ggcggtggaa caggggtttg ggcttggcga 1740  
 tcgcgttcca attccacccc gccgaccccg ccccccgtgg ttcaaacgct gcctgaggcg 1800  
 gtacctgccc cttcgcccgc gccagttacc gttgccctcg atcgggctca ggctgaaact 1860  
 gtgttgcaaa actggttggc cgctaaagct gcagccttgg ggcctcaata cgatcgcgat 1920  
 cgcttagcga cgggtgctgac cggtgagggt ctgcagactt ggcaggggtt ttctagccag 1980  
 caggccaaca ccagctcac atcacagtth gatcacaaagt taaccgtcga ctcagttcag 2040  
 ctcagtgcgc gtgatcaacg agcagtagtc caagccaagg tcgatgaagt tgagcaggtc 2100  
 tatcgaggcg accagctgct cgaaacgcgc cgagatttgg gcttggtgat ccgctaccag 2160  
 ctcgtgcgcg agaacaacat ctggaaaatt gcttcgatta gtttggtgcg ctaggaattc 2220  
 gcaaggggtg aacccctgc ggtcttttct gtagatcccc tagagcgatc gcagaatgtt 2280  
 cagcgattcc tggatgtgcg cttgggcatt caagagtga tcaaaaatgt ggcgcacctt 2340  
 gccctctttg tcgatcacat aagtgcgcgc acccggaatc acaaacaggg ttttgggcac 2400  
 gccatagggt tgacggaggc gatcgctgc atcgctcagc agttggaagg gcaagttgta 2460  
 tttctgggc 2469

<210> 5  
 <211> 631  
 <212> PRT  
 <213> Synechococcus PCC7942

<400> 5

Met Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Cys Val Gly Val Gln  
 1 5 10 15

Ala Ser Ala Asp Lys Leu Ala Glu Ser Tyr Arg Asp Arg Leu Asn Gln  
 20 25 30

Ser Pro Ser His Glu Phe Ser Glu Leu Ala Leu Gln Ala Arg Arg Gln  
 35 40 45

Leu Leu Glu Ala Ala Ile Ala Glu Leu Ser Asp Pro Glu Gln Arg Asp  
 50 55 60

Arg Tyr Asp Arg Arg Phe Phe Gln Gly Gly Leu Glu Ala Ile Glu Pro  
 65 70 75 80  
 Ser Leu Glu Leu Glu Asp Trp Gln Arg Ile Gly Ala Leu Leu Ile Leu  
 85 90 95  
 Leu Glu Leu Gly Glu Tyr Asp Arg Val Ser Gln Leu Ala Glu Glu Leu  
 100 105 110  
 Leu Pro Asp Tyr Asp Ala Ser Ala Glu Val Arg Asp Gln Phe Ala Arg  
 115 120 125  
 Gly Asp Ile Ala Leu Ala Ile Ala Leu Ser Gln Gln Ser Leu Gly Arg  
 130 135 140  
 Glu Cys Arg Gln Gln Gly Leu Tyr Glu Gln Ala Ala Gln His Phe Gly  
 145 150 155 160  
 Arg Ser Gln Ser Ala Leu Ala Asp His Gln Arg Phe Pro Glu Leu Ser  
 165 170 175  
 Arg Thr Leu His Gln Glu Gln Gly Gln Leu Arg Pro Tyr Arg Ile Leu  
 180 185 190  
 Glu Arg Leu Ala Gln Pro Leu Thr Ala Asp Ser Asp Arg Gln Gln Gly  
 195 200 205  
 Leu Leu Leu Leu Gln Ala Met Leu Asp Asp Arg Gln Gly Ile Glu Gly  
 210 215 220  
 Pro Gly Asp Asp Gly Ser Gly Leu Thr Leu Asp Asn Phe Leu Met Phe  
 225 230 235 240  
 Leu Gln Gln Ile Arg Gly Tyr Leu Thr Leu Ala Glu Gln Gln Leu Leu  
 245 250 255  
 Phe Glu Ser Glu Ala Arg Arg Pro Ser Pro Ala Ala Ser Phe Phe Ala  
 260 265 270  
 Cys Tyr Thr Leu Ile Ala Arg Gly Phe Cys Asp His Gln Pro Ser Leu  
 275 280 285  
 Ile His Arg Ala Ser Leu Leu Leu His Glu Leu Lys Ser Arg Met Asp  
 290 295 300  
 Val His Ile Glu Gln Ala Ile Ala Ser Leu Leu Leu Gly Gln Pro Glu  
 305 310 315 320

Glu Ala Glu Ala Leu Leu Val Gln Ser Gln Asp Glu Glu Thr Leu Ser  
 325 330 335  
 Gln Ile Arg Ala Leu Ala Gln Gly Glu Ala Leu Ile Val Gly Leu Cys  
 340 345 350  
 Arg Phe Thr Glu Thr Trp Leu Ala Thr Lys Val Phe Pro Asp Phe Arg  
 355 360 365  
 Asp Leu Lys Glu Arg Thr Ala Pro Leu Gln Pro Tyr Phe Asp Asp Pro  
 370 375 380  
 Asp Val Gln Thr Tyr Leu Asp Ala Ile Val Glu Leu Pro Ser Asp Leu  
 385 390 395 400  
 Met Pro Thr Pro Leu Pro Val Glu Pro Leu Glu Val Arg Ser Ser Leu  
 405 410 415  
 Leu Ala Lys Glu Leu Pro Thr Pro Ala Thr Pro Gly Val Ala Pro Pro  
 420 425 430  
 Pro Arg Arg Arg Arg Arg Asp Arg Ser Glu Arg Pro Ala Arg Thr Ala  
 435 440 445  
 Lys Arg Leu Pro Leu Pro Trp Ile Gly Leu Gly Val Val Val Val Leu  
 450 455 460  
 Gly Gly Gly Thr Gly Val Trp Ala Trp Arg Ser Arg Ser Asn Ser Thr  
 465 470 475 480  
 Pro Pro Thr Pro Pro Pro Val Val Gln Thr Leu Pro Glu Ala Val Pro  
 485 490 495  
 Ala Pro Ser Pro Ala Pro Val Thr Val Ala Leu Asp Arg Ala Gln Ala  
 500 505 510  
 Glu Thr Val Leu Gln Asn Trp Leu Ala Ala Lys Ala Ala Ala Leu Gly  
 515 520 525  
 Pro Gln Tyr Asp Arg Asp Arg Leu Ala Thr Val Leu Thr Gly Glu Val  
 530 535 540  
 Leu Gln Thr Trp Gln Gly Phe Ser Ser Gln Gln Ala Asn Thr Gln Leu  
 545 550 555 560  
 Thr Ser Gln Phe Asp His Lys Leu Thr Val Asp Ser Val Gln Leu Ser

565

570

575

Asp Gly Asp Gln Arg Ala Val Val Gln Ala Lys Val Asp Glu Val Glu  
580 585 590

Gln Val Tyr Arg Gly Asp Gln Leu Leu Glu Thr Arg Arg Asp Leu Gly  
595 600 605

Leu Val Ile Arg Tyr Gln Leu Val Arg Glu Asn Asn Ile Trp Lys Ile  
610 615 620

Ala Ser Ile Ser Leu Val Arg  
625 630

<210> 6  
<211> 1390  
<212> DNA  
<213> Synechococcus PCC7942

<400> 6  
ctcgatactt gggagttgaa cacagagtag tagtctaagt aacaactgct cgtgagcaat 60  
ttgctacact ttttaccaaa ttttgagctc agttttcgcg aaaactggga tgttgagttg 120  
aaccctcagc agcaaaattg taccgcctga gacttttacc gttttattcg gccatctggg 180  
aacaatcgcc ctggagctta ttgtgacctc taccgcgtact gccgttattg ccttggttaga 240  
acgctatttc gagctgtcgg cagcgcgagc agcagaggtc ttgcagcaac tgcgatcgca 300  
ccaccctgaa gcctggattt atcccgccac agtcgaggcg atttaccaag gccgttaccg 360  
ctgggtgtcg atcgcaaaa tccttgctct gtggcgagcg cgcgggcaga tcaactgcc 420  
cttcagtga gactatgagc gcttggtgct cgggtgaagtt ccagagcaac ccgatcgcat 480  
caatggtgag acgcggctcc ctgcatcgcc catgaccttg ccttgggtgc cagaacagcc 540  
tggaagaagca ttcgtgccag cgcaagatca gtcgggttta actgagcgcc tttataaaac 600  
gttggtcaaa gcgggcagcg attgcgctgg gtaggcttag aacagttgcc atccaaactt 660  
gagagtgcgc gttcggccag ccaagagaat tccaagagcc tttcagaacg gacaacaatt 720  
ctgctctaca atcaagcccg agtgaagagg cggcgggcta ttggctgaat ggcaaaaaac 780  
atcattcttt cagcaatcgt gggttatacc tacgacaaaa ttgacctatt cttaacttct 840  
gcactccgta acacctcagc agatattctt ttaattgcat caagtccttc agcccaactc 900  
cgatcatcagt tattgagttc acctcgggtc aaactcgttg atgtgaacct tcaaggtgaa 960  
ccagctgaaa tggatatttcg ccgtttcttt attgccaagg agattttggc gagaatcgaa 1020  
gcagatgaaa ttctcttgag cgatgctcgc gatgtctatt tccaatctga cccttttggt 1080  
gtccaagggg ttttatttgc cgaggaacct cagctaactc caaactgtaa agtcaatagc 1140

agctggataa aaaaatactt aggagaggat gagtttcaag ccatttctcc taatccaatt 1200  
 ctctgcgggg gcaaccatgt gctggatgcc accaaggcct ttagcctgac gttgaccaca 1260  
 ccagaagaaa ttgttgggct gcccgagagt ttgctggcct tggcggctca agctgctcaa 1320  
 gccgctggtg aaacagaggc aacacccgaa gccggccctt ggcgaatcac cctcgacttc 1380  
 ccaagctttg 1390

<210> 7  
 <211> 152  
 <212> PRT  
 <213> Synechococcus PCC7942

<400> 7

Met Gly Thr Ile Ala Leu Glu Leu Ile Val Thr Ser Thr Arg Thr Ala  
 1 5 10 15

Val Ile Ala Leu Leu Glu Arg Tyr Phe Glu Leu Ser Ala Ala Arg Ala  
 20 25 30

Ala Glu Val Leu Gln Gln Leu Arg Ser His His Pro Glu Ala Trp Ile  
 35 40 45

Tyr Pro Ala Thr Val Glu Ala Ile Tyr Gln Gly Arg Tyr Arg Trp Val  
 50 55 60

Ser Ile Ala Gln Ile Leu Ala Leu Trp Gln Arg Arg Gly Gln Ile Asn  
 65 70 75 80

Cys His Phe Ser Ala Asp Tyr Glu Arg Leu Leu Leu Gly Glu Val Pro  
 85 90 95

Glu Gln Pro Asp Arg Ile Asn Val Glu Thr Arg Leu Pro Ala Ile Ala  
 100 105 110

Met Thr Leu Pro Trp Val Pro Glu Gln Pro Gly Glu Ala Phe Val Pro  
 115 120 125

Ala Gln Asp Gln Ser Gly Leu Thr Glu Arg Leu Tyr Lys Thr Leu Val  
 130 135 140

Lys Ala Gly Ser Asp Cys Ala Gly  
 145 150

<210> 8

<400> 8  
 000

<210> 9  
 <211> 2406  
 <212> DNA  
 <213> *Arabidopsis thaliana*

<400> 9  
 atggaagctc tgagtcacgt cggcattggt ctctcccat tccaattatg ccgattacca 60  
 ccggcgacga caaagctccg acgtagccac aacacctcta caactatctg ctccgccagc 120  
 aaatgggccc accgtcttct ctccgacttc aatttcacct ccgattcctc ctctcctcc 180  
 ttgccaccg ccaccaccac cgccactctc gtctctctgc caccatctat tgatcgcccc 240  
 gaacgccacg tccccatccc cattgatttc taccaggtat taggagctca aacacatttc 300  
 ttaaccgatg gaatcagaag agcattcgaa gctagggttt cgaaaccgcc gcaattcggt 360  
 ttcagcgacg acgctttaat cagccggaga cagattcttc aagctgcttg cgaaactctg 420  
 tctaactctc ggtctagaag agagtacaat gaaggctctc ttgatgatga agaagctaca 480  
 gtcactactg atgttccttg ggataagggt cctggggctc tctgtgtatt gcaagaagggt 540  
 ggtgagactg agatagttct tcgggttggt gaggtctgc ttaaggagag gttgcctaag 600  
 tcgtttaagc aagatgtggt tttagttatg gcgcttgctt ttctcgatgt ctcgagggat 660  
 gctatggcat tggatccacc tgattttatt actggttatg agtttggtga ggaagctttg 720  
 aagcttttac aggaggaagg agcaagtagc cttgcaccgg atttacgtgc acaaattgat 780  
 gagactttgg aagagatcac tccgcgttat gtcttgagc tacttggtt accgcttggt 840  
 gatgattacg ctgcgaaaag actaaatggt ttaagcgggtg tgcggaatat tttgtggtct 900  
 gttggaggag gtggagcatc agctcttggt ggggggttga cccgtgagaa gtttatgaat 960  
 gaggcgtttt tatgaatgac agctgctgag cagggttgatc tttttgtagc taccccaagc 1020  
 aatattccag cagagtcatt tgaagtttac gaagttgcac ttgctcttgt ggctcaagct 1080  
 tttattggta agaagccaca ccttttacag gatgctgata agcaattcca gcaacttcag 1140  
 caggctaagg taatggctat ggagattcct gcgatgttgt atgatacacg gaataattgg 1200  
 gagatagact tcggtctaga aaggggactc tgtgcactgc ttataggcaa agttgatgaa 1260  
 tgccgtatgt gggtgggctt agacagtgag gattcacaat ataggaatcc agctattgtg 1320  
 gagtttggtt tggagaattc aaatcgtgat gacaatgatg atctccctgg actatgcaaa 1380  
 ttgttggaac cctgggtggc aggggttgct tttcctaggt tcagagacac caaagataaa 1440  
 aaatttaaac tcggggacta ctatgatgat cctatgggtt tgagttactt ggaaagagtg 1500  
 gaggtagttc aggggtctcc tttagctgct gctgcagcta tggcaaggat tggagccgag 1560  
 catgtgaaag ctagtgctat gcaggcactg cagaaagttt ttccttcccg ctatacagat 1620  
 agaaaactcg ctgaacccaa ggatgtgcaa gagacagtgt ttagtgtaga tcctgttggt 1680

aacaatgtag gccgtgatgg tgagcctggg gtctttattg cagaagctgt aagaccctct	1740
gaaaactttg aaactaatga ttatgcaatt cgagctgggg tctcagagag tagcgttgat	1800
gaaactactg ttgaaatgtc cgttgctgat atgttaaagg aggcaagtgt gaagatccta	1860
gctgctgggtg tggcaattgg actgatttca ctgttcagcc agaagtatct tcttaaaagc	1920
agctcatctt ttcaacgcaa ggatatgggt tcttctatgg aatctgatgt cgctaccata	1980
gggtcagtca gagctgacga ttcagaagca cttcccagaa tggatgctag gactgcagag	2040
aatatagtat ccaagtggca gaagattaag tctctggcct ttgggcctga tcaccgcata	2100
gaaatgttac cagaggtttt ggatgggcca atgctgaaga tttggactga cagagcagct	2160
gaaactgccc agcttgggtt ggtttatgat tatacactgt tgaaactatc tgttgacagt	2220
gtgacagtct cagcagatgg aacccgtgct ctggtggaag caactctgga ggagtctgct	2280
tgtctatctg atttgggttca tccagaaaaac aatgctactg atgtcagaac ctacacaaca	2340
agatacgaag ttttctgggt caagtcaggg tggaaaatca ctgaaggctc tgttcttgca	2400
tcataa	2406

<210> 10  
 <211> 3667  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 10	
tggtctgcat taaggagaat acaattataa gcaatttgtc ttgatttcaa caagattttg	60
cttggctata ggattcattg gctctgtttg cttttacatt tacatgtcat aatagtttcg	120
aattttacac atttcagttg gatgttaaga aaagagaggg aattgatggg gttttgtggg	180
tttaaaacttt aaagtagtca agaattaaagt cattgggttca ctgttgctct atatgtgtaa	240
aatgaaggca actccaacgg ttcttaggtg gaatagatta tttagacgat ttaacatcat	300
aaagtccgtg gcgactgtaa catcatagat tgttttttat ttttttcagt agctgggtgat	360
gttttttgat ttaacttata ctactcaaaa tcaaaaattcc ataaacccta gacgacaaaa	420
cagtctcttc aatatgtaaa acagaacaaa gtttttgtag tagcctaaaa agacactccc	480
atggaagctc tgagtcacgt cggcattggg ctctcccat tccaattatg ccgattacca	540
ccggcgacga caaagctccg acgtagccac aacacctcta caactatctg ctccgccagc	600
aaatgggccc accgtcttct ctccgacttc aatttcacct ccgattcctc ctctcctcc	660
ttcgccaccg ccaccaccac cgccactctc gtctctctgc caccatctat tgatcgctcc	720
gaacgccacg tccccatccc cattgatttc taccaggtat taggagctca aacacatttc	780
ttaaccgatg gaatcagaag agcattcgaa gctaggggtt cgaaaccgcc gcaattcggt	840
ttcagcgacg acgctttaat cagccggaga cagattcttc aagctgcttg cgaaactctg	900

tctaaccctc	ggctctagaag	agagtacaat	gaaggtcttc	ttgatgatga	agaagctaca	960
gtcatcactg	atgttccttg	ggataaggta	atttcgattt	cggaataata	aagtttcttc	1020
gttttaattt	catgaattgg	ataaaggaag	gaacttttat	ctagtgaagg	ttcctggggc	1080
tctctgtgta	ttgcaagaag	gtggtgagac	tgagatagtt	cttcgggttg	gtgaggctct	1140
gcttaaggag	aggttgccta	agtcgtttaa	gcaagatgtg	gttttagtta	tggcgcttgc	1200
gtttctcgat	gtctcgaggg	atgctatggc	attggatcca	cctgatttta	ttactggtta	1260
tgagtttggt	gaggaagctt	tgaagctttt	acaggtagtt	tgacttgctt	tggttaatttg	1320
acgagcgttg	gctttataag	aactttcttg	atttgatact	ttgttattga	gtcttgtgta	1380
ggaggaagga	gcaagtagcc	ttgcaccgga	tttacgtgca	caaattgatg	agactttgga	1440
agagatcact	ccgcgttatg	tcttggagct	acttggctta	ccgcttggtg	atgattacgc	1500
tgcgaaaaga	ctaaatgggt	taagcgggtg	gcggaatatt	ttgtggctctg	ttggaggagg	1560
tgagcatca	gctcttggtg	ggggtttgac	ccgtgagaag	tttatgaatg	aggcgttttt	1620
atgaatgaca	gctgctgagc	aggtatacag	tttagatacc	tttttttaat	ttcttttagca	1680
tgatataact	ttaggtttct	cattttaatg	tatgttgtgt	ggtaggttga	tctttttgta	1740
gctaccccaa	gcaatattcc	agcagagtca	tttgaagttt	acgaagttgc	acttgctctt	1800
gtggctcaag	cttttattgg	taagaagcca	caccttttac	aggatgctga	taagcaattc	1860
cagcaacttc	agcaggctaa	ggtaatggct	atggagattc	ctgcgatgtt	gtatgataca	1920
cggaataatt	gggagataga	cttcggtcta	gaaaggggac	tctgtgcact	gcttataggc	1980
aaagttgatg	aatgccgtat	gtggttgggc	ttagacagtg	aggattcaca	atataggaat	2040
ccagctattg	tggagtttgt	tttggagaat	tcaaatcgtg	atgacaatga	tgatctccct	2100
ggactatgca	aattgttgga	aacctgggtg	gcaggggttg	tctttcctag	gttcagagac	2160
accaaagata	aaaaatttaa	actcggggac	tactatgatg	atcctatggg	tttgagttac	2220
ttggaaagag	tggaggtagt	tcagggttct	ccttttagctg	ctgctgcagc	tatggcaagg	2280
attggagccg	agcatgtgaa	agctagtgtc	atgcaggcac	tgcaaaaagt	ttttccttcc	2340
cgctatacag	atagaaactc	ggctgaaccc	aaggatgtgc	aagagacagt	gtttagtgtg	2400
gatcctgttg	gtaacaatgt	aggccgtgat	ggtgagcctg	gtgtctttat	tgcaagaagct	2460
gtaagaccct	ctgaaaactt	tgaaactaat	gattatgcaa	ttcgagctgg	ggtctcagag	2520
agtagcgttg	atgaaactac	tgttgaaatg	tccgttgctg	atatgttaaa	ggaggcaagt	2580
gtgaagatcc	tagctgctgg	tgtggcaatt	ggactgattt	cactgttcag	ccagaagtat	2640
tttcttaaaa	gcagctcatc	ttttcaacgc	aaggatatgg	tttcttctat	ggaatctgat	2700
gtcgctacca	taggtatgat	taaatgatgc	aattttcata	tatctgcatt	gctcaaaaata	2760



tgcttgTTTT	gtgagctaag	aacatagttc	ccacttaata	catgtcccaa	aagttgtacc	2820
aagattaaca	agttgctgag	taaatttcac	taattatgct	gcttgaattt	tttgatcaaa	2880
ctgtagacag	aaatgtaa	ttcactctca	acatttctgt	ttagaataac	gtaggattag	2940
agattgcctt	agtgtggcct	tgtccaactt	ttctttcctt	gatttttttc	ttttcgattt	3000
agggtcagtc	agagctgacg	attcagaagc	acttcccaga	atggatgcta	ggactgcaga	3060
gaatatagta	tccaagtggc	agaagattaa	gtctctggct	tttgggcctg	atcaccgcat	3120
agaaatgtta	ccagaggtga	gggaataaat	ctacaattca	atcaattgtg	tgaaaactgt	3180
tggacatgat	tatagtctgg	tgccttgttt	gattctgtta	tttatagggt	ttggatgggc	3240
gaatgctgaa	gatttggact	gacagagcag	ctgaaactgc	gcagcttggg	ttggtttatg	3300
attatacact	gttgaaacta	tctgttgaca	gtgtgacagt	ctcagcagat	ggaacccgtg	3360
ctctgggtgga	agcaactctg	gaggagtctg	cttgtctatc	tgatttgggt	catccagaaa	3420
acaatgctac	tgatgtcaga	acctacacaa	caagatacga	agttttctgg	tccaagtcag	3480
gggtggaaaat	cactgaaggc	tctgttcttg	catcataata	tactcatatg	tagcatgtct	3540
gagcttgcca	gattctcttt	gttctgtaaa	ttctctctct	aagttagtgt	ttataaatga	3600
acacaaaaaa	attaacgttc	ttggcacacc	cttttccttg	atctaaacta	taacataagg	3660
gctacaa						3667

<210> 11  
 <211> 7980  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 11						
actgtaaatt	ttgataaata	aaaaaaaaaaca	aaaaaaaaagat	cgccaaatca	tatttcatac	60
tatcagattt	aaacaatata	atttgttcga	cgatacagaa	atattttacc	tcacaggaag	120
aggttgcgca	gaaggagcca	tggatgtgtt	tgttcgagtc	gagttgcttt	gttgtaagta	180
ggtaattgca	agaaacttga	gttgtctata	aagctttgga	atacttctct	ttatatatac	240
gtttacaaca	atTTTTTTTT	TTTTTTTTTT	tctattttta	caacaaattg	TTTTTTatta	300
taataataaa	cttaaacgaa	aataaataat	atctctttgt	tctatttctt	aaaaaagaaa	360
ttagcttgta	gtacttcaac	gtatcttaac	tctttagtct	ttagtaggta	tatatcatct	420
atttattttat	ttttattttt	tttatattac	gattatagtg	tacgtacgta	tttattaatc	480
aaaaataact	tggtagaagt	aaaaagaaaa	tgattttttt	tttactcagt	gatcagtttt	540
acgtttattc	aaaaataagt	tgtagtttcc	ttcttaatat	tcaagttata	tgactaaaaa	600
ttggtcgggt	aattttactat	taagattaat	cggaaactct	agttagatca	cgagataatc	660
atcacgtgga	gaaacatttg	gttcttgta	cgtggagaaa	acgttaagct	tattttttac	720

ttctttatta	tatTTTTgag	gaaatggttg	aaagaaagag	agtgtttaaa	atgtgaatgc	780
gctcgtagtt	aggtggaggt	taatgggtag	gagggtaggt	catatgtgta	ttagtgatgg	840
ataaaaatta	aaaacataaa	aaaaacttca	agctgtaaat	aatctaataa	aagaacatag	900
aaatataatc	aaagaaccat	ttaactaaat	aaatactttc	gattcaaata	gcataatttct	960
aagttccaag	aatagctatc	ctctatccac	atgttacatt	ttttttttct	ttttcacatc	1020
catatagttt	ttaaaataat	tttctagatg	gtatttttta	ttcgacattt	ttttttcctt	1080
ttagatttac	tgattataat	ttatttagaa	ataaatgata	cgactgtcgt	ttctacaaaa	1140
ctgaaatttg	caaacattgg	acaaaaaagc	gaaaccttaa	tcacttgaaa	cgacaacggt	1200
cttttagtatg	tttttgga	tacaaagtac	acataagatg	ttccctcact	cttcgattgt	1260
ttcttaacct	aatataatta	agcaatattg	aacttgagtc	actcaatgct	gcaccgaagg	1320
agcctttaga	ttttgagcaa	attcatgaga	gttttagcttc	tcattcatca	ctctgaattt	1380
ctcttttatc	ctctttatct	gtccaaaaca	tgacacataa	cataatgtta	gttctcctgc	1440
atacttccaa	tggcaaatag	aaaaaagaga	cattgatcat	agaagtcagt	ttggtttacc	1500
cttctgagct	cgatctctgt	gctccgtttc	ttttgatcaa	gtgattgccg	gagattcgtg	1560
atgtcgaaga	tactatcgag	gtcgtcttca	aatgcgtttt	ccaactcttc	ccggagaaga	1620
gcaggtaact	tatcaacgat	gggcattaga	agaaaacagt	tgaactgcag	aacaaaagaa	1680
aacacagata	caaacttttt	aaaagaaaag	tcattttaaa	agcaagaaga	atctgagtaa	1740
aaactgaagt	aggagcaaac	ctttaactca	gcagaggcga	gaaagtactc	tcgtatgccc	1800
tggaatatct	gttggaccaa	tgcgtacaca	attctctcag	aggaaggagc	aagcttgccg	1860
ttccaaagtg	tgctatctag	aagatcagcc	aaccgcattt	ctgttgtctg	aatactggaa	1920
cctgaatcga	tgtttgaggc	gagatggctt	agctttacat	ctgatcttga	cttggtgtct	1980
gttgtgccac	ctaatagcac	ttgggggaaga	ctaaatccta	tggcattacc	tgatgtcgta	2040
ttatgctctg	ttccaccaa	tgagtccaag	aattgacgta	gaccagctcg	gttctacata	2100
acattgagaa	acgaaaacta	ctcaatcaga	aacggatact	tgatggtatg	tacacaactc	2160
aattggattg	aaacagagct	atagggctgt	agcaatgacc	ttgttgtgaa	gagaccatgt	2220
aacatagcga	gttgtacttg	ctaaatcctc	catacatctg	caaacaatat	aaaatccaaa	2280
gggtgatcaa	tcactaaagc	tcactagaac	acaggtagga	ggcaccgaca	tggtagaagc	2340
aggaattgga	aatagaatta	cttgtcacga	catgattttt	ctgtggactc	cacaaaactg	2400
ttgaatgctg	aagcaacccg	cttgagaaac	acctcatgcc	cacttaaata	ttcaccttct	2460
ttctattcaa	atttagaaca	tacatcaaaa	aatttgctgg	aaagggatca	tgagtatgat	2520
accgtcaaac	caaagaaaac	agtacctacc	tgaagaagat	atacagaaat	tggaagcaat	2580

ctcttgagaa	tgtgtagaag	cctcgcccct	aactatatca	acgcaaaaaca	aacgaaaatg	2640
agaactggaa	aaaactttct	gtatggaaaag	agaaacatgt	gaataacaaa	atttcagatg	2700
aaagtattcc	caaacatagt	ttctgtaagc	agaacatggt	tactcgataa	ctcttatgca	2760
caaataagtt	ccagcaaadc	tcaaaaactga	atggtagtat	gatttcaata	tataacgtta	2820
tatttcattt	ttttttttac	gtacagtaca	ccttaactaa	ttagtaaaat	tgctttccat	2880
cctccacgaa	agaaaaagaa	aaaagtagct	atatctatgt	cacctgatga	aggaaagggt	2940
caaacgtctc	acgagccttc	gcaactgcta	taacacaagc	tggtctacaa	cagcaaataa	3000
gagaaaagaga	ataagaggcc	atagaaaaaca	tgacaaacgt	tgacagctcag	attagatact	3060
gaaaggggtc	tgggatgcaa	agacaataaa	ttgagaagtg	tggtgcatgt	cagtcaatcc	3120
tatgatacct	ggaatagttt	gttccatcat	gaatatcctc	aactccacat	gcatttataa	3180
tttcctccct	cgttattggg	ggacatttga	tagcaccaac	tagaaaacga	aactcagcca	3240
tggcacggtg	atattgtgca	ccccataga	gacgcatccc	tgcatctctg	aaaatgaaag	3300
ataatctggg	tatgggtctc	cataattctt	gaagggtcaa	cgaagtatct	cttttatttg	3360
tttccaatac	attattcttt	ggcacatatg	tttcatgcgg	tcaaatttat	cttccatcat	3420
attataatcc	atgtacaaga	acaagacaac	tggatttgaa	gaccatgccc	agcttgctct	3480
ataaagtcca	acaatattct	gcttcaggga	aagacttacc	ggtattagct	tatgtgaaaa	3540
ctggagacca	tcagtaccaa	caaagtctcc	tccttggtgc	ctttcatctt	gcagtgtctc	3600
acctgaaaaa	caccatgaga	aattattaac	aatcaaagaa	ccaacataa	agagaatgct	3660
gttataaaat	gtgcttctgc	cagtaaccaa	agtatcatga	ccaatgattg	attgattagc	3720
atacatcatt	ccatgtgtaa	tcacgcagct	ctggtgaccc	agtcgaattg	aacaatatgc	3780
atttaactaa	actgattttg	caaaagtcca	atttaacaac	accagaaac	aagaaaaggt	3840
tatgccaaaag	aagttgacta	gcagagaaca	gagcagtaac	attaccaaata	ttatctggag	3900
gggccacaac	tggtcccttc	aataacagcg	ataactgatc	aagaaaaata	taaacaaaac	3960
agggtgagaaa	acacagcact	gatcaatact	aacaaaggta	cttcgtacgt	caatcagaaa	4020
atatgacgca	gcaattttta	agtcttaagg	gcatccaaca	caaaaagttt	acagccattc	4080
tgaatttgta	gcaagtccta	gatatcattt	actgtagcat	aattttatat	gtgtcagtaa	4140
tcaataaaca	aatttgtttt	tatgtgtcag	tagttaataa	acaaaaaaa	aagagaaggt	4200
tacacaaatg	aacttggtgt	aattatacaa	aaactattaa	tccacgagtc	caggcaaaaa	4260
tgaaaaggta	tgggaagggtg	taaatagaaa	tctaaaaaaa	cgaaatgctc	tctacagtta	4320
ccttggttaa	gaagagatca	tggaaagtcc	tgctctctc	tttgagtttt	gcttcatcca	4380
aagagctgca	ttgaaaggaa	ttattcaacc	tccaatgagt	tatattttct	ataaatcagt	4440

agctaacaat	taaactgcct	aaaatcaagt	agacattttc	agacaaaaca	aattgcgacc	4500
taagttcctt	gctcacggta	tccagctttc	tgactgtact	gcggtactcc	tttcctaaca	4560
gtggaatgat	caatggaaca	ctctctttgt	acctggaaaag	agaagggcat	caagactaca	4620
gcgaaaagta	aactacaata	gaaacagagg	ctggaaaaat	cagagttaaa	acaacagtta	4680
taccttttcc	agagtagttc	ttccagaaac	aacctcagtt	tactgatgcc	aatcctactc	4740
ttttcctggt	ttgtcagtaa	acggcccaac	ttctttctcta	aagatgcaat	gtcttccatt	4800
tctctaagtg	acacagcctg	taataaaaaac	cacacatagt	ttagaaaaag	acctgtttaa	4860
cttgtttaag	gaatcagaca	gcagagcaga	gacctgtttg	aactcgtcat	tagacttata	4920
cactgaatcc	tgtccatagc	caactcttcc	agaaggcaca	gacgtgaaaa	aaggagaatc	4980
gccaataaag	gagctgtcaa	gtgcgcttgc	aggagggtgag	agaaagactt	ccacgtcaga	5040
tgaacatgag	aattgagggg	ttttagtgtc	aagctttgta	gaaacaacaa	ttgtcctaga	5100
aagctcagga	tcaacctaca	tgaacgagaa	acaaacttta	acaaaaataa	agacaagggt	5160
agacgcaatg	gagttacgtc	aagcaacgta	cttgcatcac	tatccttcga	gtgggtgcaa	5220
tgctccagtc	actgctatct	tcgaggcata	aaatgatgaa	ctctttgtgt	tgcatctttg	5280
ctcggactag	agcttccaca	gcccgtgctt	gaacctaaga	aaaagaacaa	gtaaccact	5340
ctcaaataaa	gcaaaaacaa	aacatgaaat	cagccacgga	attggctgga	agccataaga	5400
aaaaacaacc	tgaagagctc	ggtttttcag	tcctgggtgca	ggagcaataa	gtccagggtgt	5460
atcaatgatg	gtaaggtttg	gacaatactt	atactggact	ttcacaataa	tctcctttgc	5520
agagaatggg	ctacatggct	cttgctccag	cctcatgttc	tcagcctcaa	tatatgccta	5580
actccaaatc	atataacaaa	tttcgttaac	atgagcattt	cgcttctcta	caataaacct	5640
aagtacttgt	gtttctcaac	attcgtcaaa	atcttcccag	aatttatacg	cagaaacaag	5700
caattgaaga	agcacaagta	ataataataa	caaaacacct	gaatttgtga	gagagatttg	5760
ggaagagaaa	cggaaggatc	atcatcagat	ccgagatgac	aaagcgggaa	ttgacactga	5820
ggatcgtact	tcatatggag	agtaatcggc	cgacgagtct	tggttccgcc	gccgacatgg	5880
ttaaattgaa	accccataag	agcttccaca	agcgcacttt	taccgtcggg	ctgctgtccc	5940
accacaagaa	ccgccggtgc	ttcgaacggc	gtctccaatt	cctgcgcaa	agcgtgtaac	6000
tcgttgtaag	cttcgtaaag	actccaccgc	tcctcaatcg	cagcgtcgtc	ctcttccgcc	6060
atttcctcaa	ccgtcaccga	ttttgctgat	acttccgcc	tcgtctctta	cgaaaatgag	6120
caagaggaag	agtaagagta	agagagtgtc	tcttatttct	tctactcttt	agttttcgtc	6180
gccgttcctt	tttccgccat	ggaattagca	gatacggcta	atttcaattt	ttgtcaaaag	6240
aaatatTTTT	tgtgttttaa	tctcacgcgc	atccatggcg	cgttgagtca	acgttgtaat	6300

agttctccgc	taaatttaaa	taaaagagcg	cgtaaggaga	gagtttaagg	atTTTTTTTT	6360
tttggtcggc	aaatacaaaag	gatttgcttt	gtcttgacca	atagtatatg	cagaaatatt	6420
atctcaaagg	atttgtgata	actatgtagt	acagaattgt	gattattgga	tgagaaacca	6480
gaaatatttt	gagcaaatga	cgacttgta	atttactatt	ttttcatttc	ttaaaggctc	6540
ctcttgtgta	actatgatta	aaattgaaat	agtgactttt	attgttacga	catggaacaa	6600
atcaacgagt	tctattgtta	aagagagaca	ttgatgaatg	taacaaaact	gtggcttaga	6660
agccgaaagg	agacttagtt	cgggtccctc	cttcaccgta	ttgctcggtc	cattttctca	6720
attcgttcat	tgctgctcg	tcgtatgcca	ctgacggact	tacctgcaa	ttacattaca	6780
atgacgcaat	ttcgataatg	caaacaccag	gggaaaaaac	atgaatagag	atgatgatga	6840
tgTTTTTTaa	gagattgatc	aataccttag	ctttggattg	aatgaagtcg	tccaaactca	6900
gtggctcgtag	atcaggggac	gcatttgta	ccgagtcctg	ataattcgac	gtttcaaaag	6960
catggagtga	gtacaaaaat	tatttttcgt	aacaacagaa	atcaactgtg	tgggtttatg	7020
catgtcctta	ccttgttttc	ttcttgtaac	aattcttgaa	caggtctgta	tgcagctgct	7080
atgcatagat	tctgcaatgt	aagaaaagaa	aaggaatcag	aactactgtg	ttgaatcata	7140
ctcgaacttg	taaatgaaac	cccgaatgac	caaaccttta	gatcgcttcc	tgaatatcct	7200
tcggtttcct	ttgcaagttt	atcaaaactcg	aaaccagttt	caagattttc	tgggtgtcaga	7260
aatatcttca	atatcttcaa	ccggttttcc	gcatctggta	aatccacata	tatcctataa	7320
acacaagcct	caatacaatt	atcgaaaaga	tacaaatatt	ccaaaggaga	aattacttga	7380
aagcttaaat	taccgtcttg	gtagcctacg	aatgacagcg	tcatacaagat	caaaagggtcg	7440
gttgggtggca	ccgagaatga	gaatcctttg	gctatctttt	gatctgagtc	catcccaagc	7500
tgccataaac	tcattttctca	ttcttcgtgt	tgctcgtg	tcaaaagcac	caccacgagc	7560
acccaacaaa	ctgtcaacct	atacgacaac	aaaataaatt	acagtttagtc	cttgagtaac	7620
acatttttacg	catcacaaaa	gtattcctca	taaaaagcaa	taaccgaaat	tgaaaagtga	7680
tataaagcta	aacaatttct	cacctcatca	acaaatataa	tgacgggggc	tagtttgctt	7740
gcaaaagaga	acaaagcctt	cgtgagcttc	tctgcatctc	caaaccactg	tgccaaacaa	7800
tggacgaaat	tgacttaaat	cagaaccaat	cagaggtaaa	gttggaaaga	gatttactct	7860
aagttacaat	cggcattgac	aataataagt	cgatgaccgg	ggtggaaaag	tttttcttat	7920
gtcattagat	attctcctta	tttatatgaa	gatgtttaca	aagtggaata	tcaacgtgac	7980

<210> 12  
 <211> 2678  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 12

gaaattagcc gtatctgcta attccatggc ggaaaaagga acggcgacga aaactaaaga	60
gtagaagaaa taagagacac tctcttactc ttactcttcc tcttgctcat tttcgtaaga	120
gacgatggcg gaagtatcag caaaatcggg gacgggttgag gaaatggcgg aagaggacga	180
cgctgcgatt gaggagcggg ggagtcttta cgaagcttac aacgagttac acgctttggc	240
gcaggaattg gagacgccgt tcgaagcacc ggcggttctt gtggtgggac agcagaccga	300
cggtaaaagt gcgcttggtg aagctcttat ggggtttcaa tttaaccatg tcggcggcgg	360
aaccaagact cgtcggccga ttactctcca tatgaagtac gatcctcagt gtcaattccc	420
gctttgtcat ctcggatctg atgatgatcc ttccgtttct cttcccaaatt ctctctcaca	480
aattcacgca tatattgagg ctgagaacat gaggctggag caagagccat gtagcccatt	540
ctctgcaaag gagattattg tgaaagtcca gtataagtat tgtccaaacc ttaccatcat	600
tgatacacct ggacttattg ctctgcacc aggactgaaa aaccgagctc ttcaggttca	660
agcacgggct gtggaagctc tagtccgagc aaagatgcaa cacaaagagt tcatcatttt	720
atgcctcgaa gatagcagtg actggagcat tgcaaccact cgaaggatag tgatgcaagt	780
tgatcctgag ctttctagga caattgttgt ttctacaaag cttgacacta aaatccctca	840
attctcatgt tcatctgacg tggaaagtctt tctctcacct cctgcaagcg cacttgacag	900
ctccttattg ggcgattctc cttttttcac gtctgtgcct tctggaagag ttggctatgg	960
acaggattca gtgtataagt ctaatgacga gttcaaacag gctgtgtcac ttagagaaat	1020
ggaagacatt gcatcttttag agaagaagtt gggccgttta ctgacaaaac aggaaaagag	1080
taggattggc atcagtaaac tgagggttgt tctggaagaa ctactctgga aaaggtacaa	1140
agagagtgtt ccattgatca ttccactgtt aggaaaggag taccgcagta cagtcagaaa	1200
gctggatacc gtgagcaagg aacttagctc tttggatgaa gcaaaactca aagagagagg	1260
caggactttc catgatctct tcttaaccaa gttatcgctg ttattgaagg gaacagttgt	1320
ggcccccca gataaatttg gtgagacact gcaagatgaa aggacacaag gaggagcatt	1380
tgttggtact gatggtctcc agttttcaca taagctaata cagaatgcag ggatgcgtct	1440
ctatgggggt gcacaatatc accgtgccat ggctgagttt cgttttctag ttggtgctat	1500
caaagtgtcc ccaataacga gggaggaaat tgtaaatgca tgtggagttg aggatattca	1560
tgatggaaca aactattcca gaacagcttg tgttatagca gttgcgaagg ctcgtgagac	1620
gtttgaacct ttccttcac agttaggggc gaggcttcta cacattctca agagattgct	1680
tccaatttct gtatatcttc ttcagaaaga aggtgaatat ttaagtgggc atgaggtgtt	1740
tctcaagcgg gttgcttcag cattcaacag ttttgtggag tccacagaaa aatcatgtcg	1800
tgacaaatgt atggaggatt tagcaagtac aactcgctat gttacatggt ctcttcacaa	1860

caagaaccga gctggtctac gtcaattctt ggactcattt ggtggaacag agcataatac 1920  
 gacatcaggt aatgccatag gatttagtct tccccaagat gcattagggtg gcacaacaga 1980  
 caccaagtca agatcagatg taaagctaag ccatctcgcc tcaaacatcg attcagggttc 2040  
 cagtattcag acaacagaaa tgcggttggc tgatcttcta gatagcacac tttggaaccg 2100  
 caagcttgct ccttcctctg agagaattgt gtacgcattg gtccaacaga tattccaggg 2160  
 catacgagag tactttctcg cctctgctga gttaaagtgc aactgttttc ttctaagtcc 2220  
 catcgttgat aagttacctg ctcttctccg ggaagagttg gaaaacgcat ttgaagacga 2280  
 cctcgatagt atcttcgaca tcacgaatct ccggcaatca cttgatcaaa agaaacggag 2340  
 cacagagatc gagctcagaa gggtaaagag gataaaagag aaattcagag tgatgaatga 2400  
 gaagctaaac tctcatgaat ttgctcaaaa tctaaaggct ccttcggtgc agcattgagt 2460  
 gactcaagtt caatattgct taattatatt aggttaagaa acaatcgaag agtgagggaa 2520  
 catcttatgt gtactttgta tgtccaaaaa catactaaag aacgttgctg tttcaagtga 2580  
 ttaagggttc gctttttggt ccaatgtttg caaatttcag tttttagtaa acgacagtcg 2640  
 tatcatttat ttctaaataa attataatca gtaaattct 2678

<210> 13  
 <211> 777  
 <212> PRT  
 <213> Arabidopsis thaliana

<400> 13

Met Ala Glu Val Ser Ala Lys Ser Val Thr Val Glu Glu Met Ala Glu  
1 5 10 15

Glu Asp Asp Ala Ala Ile Glu Glu Arg Trp Ser Leu Tyr Glu Ala Tyr  
20 25 30

Asn Glu Leu His Ala Leu Ala Gln Glu Leu Glu Thr Pro Phe Glu Ala  
35 40 45

Pro Ala Val Leu Val Val Gly Gln Gln Thr Asp Gly Lys Ser Ala Leu  
50 55 60

Val Glu Ala Leu Met Gly Phe Gln Phe Asn His Val Gly Gly Gly Thr  
65 70 75 80

Lys Thr Arg Arg Pro Ile Thr Leu His Met Lys Tyr Asp Pro Gln Cys  
85 90 95

Gln Phe Pro Leu Cys His Leu Gly Ser Asp Asp Asp Pro Ser Val Ser  
100 105 110

Leu Pro Lys Ser Leu Ser Gln Ile His Ala Tyr Ile Glu Ala Glu Asn  
115 120 125

Met Arg Leu Glu Gln Glu Pro Cys Ser Pro Phe Ser Ala Lys Glu Ile  
130 135 140

Ile Val Lys Val Gln Tyr Lys Tyr Cys Pro Asn Leu Thr Ile Ile Asp  
145 150 155 160

Thr Pro Gly Leu Ile Ala Pro Ala Pro Gly Leu Lys Asn Arg Ala Leu  
165 170 175

Gln Val Gln Ala Arg Ala Val Glu Ala Leu Val Arg Ala Lys Met Gln  
180 185 190

His Lys Glu Phe Ile Ile Leu Cys Leu Glu Asp Ser Ser Asp Trp Ser  
195 200 205

Ile Ala Thr Thr Arg Arg Ile Val Met Gln Val Asp Pro Glu Leu Ser  
210 215 220

Arg Thr Ile Val Val Ser Thr Lys Leu Asp Thr Lys Ile Pro Gln Phe  
225 230 235 240

Ser Cys Ser Ser Asp Val Glu Val Phe Leu Ser Pro Pro Ala Ser Ala  
245 250 255

Leu Asp Ser Ser Leu Leu Gly Asp Ser Pro Phe Phe Thr Ser Val Pro  
260 265 270

Ser Gly Arg Val Gly Tyr Gly Gln Asp Ser Val Tyr Lys Ser Asn Asp  
275 280 285

Glu Phe Lys Gln Ala Val Ser Leu Arg Glu Met Glu Asp Ile Ala Ser  
290 295 300

Leu Glu Lys Lys Leu Gly Arg Leu Leu Thr Lys Gln Glu Lys Ser Arg  
305 310 315 320

Ile Gly Ile Ser Lys Leu Arg Leu Phe Leu Glu Glu Leu Leu Trp Lys  
325 330 335

Arg Tyr Lys Glu Ser Val Pro Leu Ile Ile Pro Leu Leu Gly Lys Glu  
340 345 350

Tyr Arg Ser Thr Val Arg Lys Leu Asp Thr Val Ser Lys Glu Leu Ser



355					360					365					
Ser	Leu	Asp	Glu	Ala	Lys	Leu	Lys	Glu	Arg	Gly	Arg	Thr	Phe	His	Asp
370					375					380					
Leu	Phe	Leu	Thr	Lys	Leu	Ser	Leu	Leu	Leu	Lys	Gly	Thr	Val	Val	Ala
385					390					395					400
Pro	Pro	Asp	Lys	Phe	Gly	Glu	Thr	Leu	Gln	Asp	Glu	Arg	Thr	Gln	Gly
				405					410					415	
Gly	Ala	Phe	Val	Gly	Thr	Asp	Gly	Leu	Gln	Phe	Ser	His	Lys	Leu	Ile
			420					425					430		
Gln	Asn	Ala	Gly	Met	Arg	Leu	Tyr	Gly	Gly	Ala	Gln	Tyr	His	Arg	Ala
		435					440					445			
Met	Ala	Glu	Phe	Arg	Phe	Leu	Val	Gly	Ala	Ile	Lys	Cys	Pro	Pro	Ile
	450					455					460				
Thr	Arg	Glu	Glu	Ile	Val	Asn	Ala	Cys	Gly	Val	Glu	Asp	Ile	His	Asp
465					470					475					480
Gly	Thr	Asn	Tyr	Ser	Arg	Thr	Ala	Cys	Val	Ile	Ala	Val	Ala	Lys	Ala
				485					490					495	
Arg	Glu	Thr	Phe	Glu	Pro	Phe	Leu	His	Gln	Leu	Gly	Ala	Arg	Leu	Leu
			500					505					510		
His	Ile	Leu	Lys	Arg	Leu	Leu	Pro	Ile	Ser	Val	Tyr	Leu	Leu	Gln	Lys
	515						520					525			
Glu	Gly	Glu	Tyr	Leu	Ser	Gly	His	Glu	Val	Phe	Leu	Lys	Arg	Val	Ala
	530					535					540				
Ser	Ala	Phe	Asn	Ser	Phe	Val	Glu	Ser	Thr	Glu	Lys	Ser	Cys	Arg	Asp
545					550					555					560
Lys	Cys	Met	Glu	Asp	Leu	Ala	Ser	Thr	Thr	Arg	Tyr	Val	Thr	Trp	Ser
				565					570					575	
Leu	His	Asn	Lys	Asn	Arg	Ala	Gly	Leu	Arg	Gln	Phe	Leu	Asp	Ser	Phe
			580					585					590		
Gly	Gly	Thr	Glu	His	Asn	Thr	Thr	Ser	Gly	Asn	Ala	Ile	Gly	Phe	Ser
		595					600					605			

Leu Pro Gln Asp Ala Leu Gly Gly Thr Thr Asp Thr Lys Ser Arg Ser  
610 615 620

Asp Val Lys Leu Ser His Leu Ala Ser Asn Ile Asp Ser Gly Ser Ser  
625 630 635 640

Ile Gln Thr Thr Glu Met Arg Leu Ala Asp Leu Leu Asp Ser Thr Leu  
645 650 655

Trp Asn Arg Lys Leu Ala Pro Ser Ser Glu Arg Ile Val Tyr Ala Leu  
660 665 670

Val Gln Gln Ile Phe Gln Gly Ile Arg Glu Tyr Phe Leu Ala Ser Ala  
675 680 685

Glu Leu Lys Phe Asn Cys Phe Leu Leu Met Pro Ile Val Asp Lys Leu  
690 695 700

Pro Ala Leu Leu Arg Glu Glu Leu Glu Asn Ala Phe Glu Asp Asp Leu  
705 710 715 720

Asp Ser Ile Phe Asp Ile Thr Asn Leu Arg Gln Ser Leu Asp Gln Lys  
725 730 735

Lys Arg Ser Thr Glu Ile Glu Leu Arg Arg Val Lys Arg Ile Lys Glu  
740 745 750

Lys Phe Arg Val Met Asn Glu Lys Leu Asn Ser His Glu Phe Ala Gln  
755 760 765

Asn Leu Lys Ala Pro Ser Val Gln His  
770 775

<210> 14  
<211> 6900  
<212> DNA  
<213> Arabidopsis thaliana

<400> 14  
actgtaaatt ttgataaata aaaaaaaaca aaaaaaagat cgccaaatca tatttcatac 60  
tatcagatatt aaacaatata atttgttcga cgatacagaa atattttacc tcacaggaag 120  
aggttgcgca gaaggagcca tggatgtgtt tgttcgagtc gagttgcttt gttgtaagta 180  
ggtaattgca agaaacttga gttgtctata aagcttttga atacttctct ttatatatac 240  
gtttacaaca attttttttt tttttttttt tctattttta caacaaattg ttttttatta 300  
taataataaaa cttaaacgaa aataaataat atctctttgt tctattttctt aaaaaagaaa 360

ttagcttgta gtacttcaac gtatcttaac tctttagtct ttagtaggta tatatcatct	420
atattatttat ttttattttt tttatattac gattatagtg tacgtacgta tttattaatc	480
aaaaataact tggtagaagt aaaaagaaaa tgattttttt tttactcagt gatcagtttt	540
acgtttattc aaaaataagt tgtagtttcc ttcttaatat tcaagttata tgactaaaaa	600
ttggtcgggtt aatttactat taagattaat cggaaactct agttagatca cgagataatc	660
atcacgtgga gaaacatttg gttcttgta cgtggagaaa acgttaagct tattttttac	720
ttctttatta tatttttgag gaaatggttg aaagaaagag agtgtttaaa atgtgaatgc	780
gctcgtagtt aggtggaggt taatgggtag gagggtaggt catatgtgta ttagtgatgg	840
ataaaaatta aaacataaa aaaaacttca agctgtaa atctaataa aagaacatag	900
aaatataatc aaagaaccat ttaactaaat aaatactttc gattcaaata gcatatttct	960
aagttccaag aatagctatc ctctatccac atgttacatt ttttttttct ttttcacatc	1020
catatagttt ttaaaataat tttctagatg gtatttttta ttcgacattt ttttttcctt	1080
ttagatttac tgattataat ttatttagaa ataaatgata cgactgtcgt ttctacaaaa	1140
ctgaaatttg caaacatttg accaaaaagc gaaaccttaa tcacttgaaa cgacaacgtt	1200
ctttagatg tttttggaca tacaaagtac acataagatg ttccctcact cttcgattgt	1260
ttcttaacct aatataatta agcaatattg aacttgagtc actcaatgct gcaccgaagg	1320
agcctttaga ttttgagcaa attcatgaga gtttagcttc tcattcatca ctctgaattt	1380
ctcttttatc ctctttatct gtccaaaaca tgacacataa cataatgta gttctcctgc	1440
atacttccaa tggcaaatag aaaaaagaga cattgatcat agaagtcagt ttggtttacc	1500
cttctgagct cgatctctgt gctccgtttc ttttgatcaa gtgattgccg gagattcgtg	1560
atgtcgaaga tactatcgag gtcgtcttca aatgcgtttt ccaactcttc ccggagaaga	1620
gcaggtaact tatcaacgat gggcattaga agaaaacagt tgaactgcag aacaaaagaa	1680
aacacagata caaacttttt aaaagaaaag tcatttttaa agcaagaaga atctgagtaa	1740
aaactgaagt aggagcaaac cttaactca gcagaggcga gaaagtactc tcgtatgccc	1800
tggaatatct gttggaccaa tgcgtacaca attctctcag aggaaggagc aagcttgagg	1860
ttccaaagtg tgctatctag aagatcagcc aaccgcattt ctgttgtctg aatactggaa	1920
cctgaatcga tgtttgaggc gagatggctt agctttacat ctgatcttga cttggtgtct	1980
gttgtgccac ctaatgcac ttgggggaaga ctaaatccta tggcattacc tgatgtcgta	2040
ttatgctctg ttccaccaa tgagtccaag aattgacgta gaccagctcg gttctacata	2100
acattgagaa acgaaaacta ctcaatcaga aacggatact tgatggtatg tacacaactc	2160
aattggattg aaacagagct atagggctgt agcaatgacc ttgttgtgaa gagaccatgt	2220

aacatagcga gttgtacttg ctaaadcctc catacatctg caaacaatat aaaatccaaa	2280
gggtgatcaa tcactaaagc tcactagaac acaggtagga ggcaccgaca tggtaagaac	2340
aggaattgga aatagaatta cttgtcacga catgattttt ctgtggactc cacaaaactg	2400
ttgaatgctg aagcaaccg cttgagaaac acctcatgcc cacttaaata ttcaccttct	2460
ttctattcaa atttagaaca tacatcaaaa aatttgctgg aaagggatca tgagtatgat	2520
accgtcaaac caaagaaaac agtacctacc tgaagaagat atacagaaat tggaagcaat	2580
ctcttgagaa tgtgtagaag cctcgcccct aactatatca acgcaaaaaca aacgaaaatg	2640
agaactggaa aaaactttct gtatggaaaag agaaacatgt gaataacaaa atttcagatg	2700
aaagtattcc caaacatagt ttctgtaagc agaacatggt tactcgataa ctcttatgca	2760
caaataagtt ccagcaaatc tcaaaaactga atggtagtat gatttcaata tataacgtta	2820
tatttcattht ttttttttac gtacagtaca ccttaactaa ttagtaaaaat tgctttccat	2880
cctccacgaa agaaaaagaa aaaagtagct atatctatgt cacctgatga aggaaagggt	2940
caaacgtctc acgagccttc gcaactgcta taacacaagc tgttctacaa cagcaataa	3000
gagaaaagaga ataagaggcc atagaaaaca tgacaaacgt tgcagctcag attagatact	3060
gaaaggggtc tgggatgcaa agacaataaa ttgagaagtg tgttgcatgt cagtcaatcc	3120
tatgatacct ggaatagttt gttccatcat gaatatctc aactccacat gcatttaciaa	3180
tttctccct cgttattggg ggacatttga tagcaccaac tagaaaacga aactcagcca	3240
tggcacggtg atattgtgca ccccataga gacgcatccc tgcattctgt aaaatgaaag	3300
ataatctggg tatgggtctc cataattctt gaagggtcaa cgaagtatct cttttatttg	3360
tttccaatac attattcttt ggcacatatg tttcatgctg tcaaatttat cttccatcat	3420
attataatcc atgtacaaga acaagacaac tggatttgaa gaccatgccc agcttgctct	3480
ataaagtcca acaatattct gcttcaggga aagacttacc ggtattagct tatgtgaaaa	3540
ctggagacca tcagtaccaa caaatgctcc tccttggtgc ctttcatctt gcagtgtctc	3600
acctgaaaaa caccatgaga aattattaac aatcaaagaa cccaacataa agagaatgct	3660
gttataaaat gtgcttctgc cagtaaccaa agtatcatga ccaatgattg attgattagc	3720
atacatcatt ccatgtgtaa tcatcgagc ctggtgaccc agtcgaattg aacaatatgc	3780
atttaactaa actgattttg caaaagtcca atttaacaac acccagaaac aagaaaagtt	3840
tatgccaaaag aagttgacta gcagagaaca gagcagtaac attaccaaat ttatctggag	3900
gggccacaac tgttcccttc aataacagcg ataactgatc aagaaaaata taaacaaaac	3960
aggtgagaaa acacagcact gatcaatact aacaaaggta cttcgtacgt caatcagaaa	4020
atatgacgca gcaattttaa agtcttaagg gcatccaaca caaaaagttt acagccattc	4080

tgaatttgta	gcaagtccta	gatatcattt	actgtagcat	aattttatat	gtgtcagtaa	4140
tcaataaaca	aatttgtttt	tatgtgtcag	tagttaataa	accaaaaaaa	aagagaagtt	4200
tacacaaatg	aacttgttgt	aattatacaa	aaactattaa	tccacgagtc	caggcaaaaa	4260
tgaaaaggta	tgggaagggtg	taaatagaaa	tctaaaaaaa	cgaaatgctc	tctacagtta	4320
ccttggttaa	gaagagatca	tggaaagtcc	tgctctcttc	tttgagtttt	gcttcattcca	4380
aagagctgca	ttgaaaggaa	ttattcaacc	tccaatgagt	tatatTTTTct	ataaatcagt	4440
agctaacaat	taaactgcct	aaaatcaagt	agacattttc	agacaaaaaca	aattgcgacc	4500
taagttcctt	gctcacggta	tccagctttc	tgactgtact	gcggtactcc	tttctaaca	4560
gtggaatgat	caatggaaca	ctctctttgt	acctggaaaag	agaagggcat	caagactaca	4620
gcgaaaagta	aactacaata	gaaacagagg	ctggaaaaat	cagagttaaa	acaacagtta	4680
taccttttcc	agagtagttc	ttccagaaac	aacctcagtt	tactgatgcc	aatcctactc	4740
ttttcctggt	ttgtcagtaa	acggcccaac	ttcttctcta	aagatgcaat	gtcttccatt	4800
tctctaagtg	acacagcctg	taataaaaaac	cacacatagt	ttagaaaaag	acctgtttaa	4860
cttgtttaag	gaatcagaca	gcagagcaga	gacctgtttg	aactcgtcat	tagacttata	4920
cactgaatcc	tgtccatagc	caactcttcc	agaaggcaca	gacgtgaaaa	aaggagaatc	4980
gccaataaag	gagctgtcaa	gtgcgcttgc	aggagggtgag	agaaagactt	ccacgtcaga	5040
tgaacatgag	aattgagggga	ttttagtgtc	aagctttgta	gaaacaacaa	ttgtcctaga	5100
aagctcagga	tcaacctaca	tgaacgagaa	acaaacttta	acaaaaataa	agacaagggt	5160
agacgcaatg	gagttacgtc	aagcaacgta	cttgcatcac	tatccttcga	gtgggttgcaa	5220
tgctccagtc	actgctatct	tcgaggcata	aaatgatgaa	ctctttgtgt	tgcatctttg	5280
ctcggactag	agcttccaca	gcccggtgctt	gaacctaaaga	aaaagaacaa	gtaaccctact	5340
ctcaaataaa	gcaaaaaccaa	aacatgaaat	cagccacgga	attggctgga	agccataaga	5400
aaaaacaacc	tgaagagctc	ggtttttcag	tcctgggtgca	ggagcaataa	gtccagggtgt	5460
atcaatgatg	gtaaggtttg	gacaatactt	atactggact	ttcacaataa	tctcctttgc	5520
agagaatggg	ctacatggct	cttgctccag	cctcatgttc	tcagcctcaa	tatatgccta	5580
actccaaatc	atataacaaa	tttcgttaac	atgagcattt	cgcttctcta	caataaacct	5640
aagtacttgt	gtttctcaac	attcgtcaaa	atcttcccag	aatttatacg	cagaaacaag	5700
caattgaaga	agcacaagta	ataataataa	caaaacacct	gaatttgtga	gagagatttg	5760
ggaagagaaa	cggaaggatc	atcatcagat	ccgagatgac	aaagcgggaa	ttgacactga	5820
ggatcgtact	tcatatggag	agtaatcggc	cgacgagtct	tggttccgcc	gccgacatgg	5880
ttaaatgaa	accccataag	agcttccaca	agcgcacttt	taccgtcgggt	ctgctgtccc	5940

accacaagaa	ccgccggtgc	ttcgaacggc	gtctccaatt	cctgcgcaa	agcgtgtaac	6000
tcgttgtaag	cttcgtaaag	actccaccgc	tcctcaatcg	cagcgtcgtc	ctcttcgcgc	6060
atttcctcaa	ccgtcaccga	ttttgctgat	acttcgcga	tcgtctctta	cgaaaatgag	6120
caagaggaag	agtaagagta	agagagtgtc	tcttatttct	tctactcttt	agttttcgtc	6180
gccgttcctt	tttccgccat	ggaattagca	gatacggcta	atttcaattt	ttgtcaaaag	6240
aaatattttt	tgtgttttaa	tctcacgcgc	atccatggcg	cgttgagtca	acgttgtaat	6300
agttctccgc	taaatttaaa	taaaagagcg	cgtaaggaga	gagtttaagg	attttttttt	6360
tttggtcggc	aaatacaaaag	gatttgcttt	gtcttgacca	atagtatatg	cagaaatatt	6420
atctcaaagg	atttgtgata	actatgtagt	acagaattgt	gattattgga	tgagaaacca	6480
gaaatatttt	gagcaaatga	cgacttgta	atttactatt	ttttcatttc	ttaaagggtct	6540
ctcttggtga	actatgatta	aaattgaaat	agtgactttt	attgttacga	catggaacaa	6600
atcaacgagt	tctattgtta	aagagagaca	ttgatgaatg	taacaaaact	gtggcttaga	6660
agccgaaagg	agacttagtt	cgggtccctc	cttcaccgta	ttgctcgttc	cattttctca	6720
attcgttcat	tgtcgtcgcg	tcgtatgcca	ctgacggact	tacctgcaaa	ttacattaca	6780
atgacgcaat	ttcgataatg	caaacaccag	gggaaaaaac	atgaatagag	atgatgatga	6840
tgttttttta	gagattgatc	aataccttag	ctttggattg	aatgaagtcg	tccaaactca	6900

<210> 15  
 <211> 2319  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 15	
atggcggaag	tatcagcaaa atcgggtgacg gttgaggaaa tggcggaaga ggacgacgct 60
gcgattgagg	agcgggtggag tctttacgaa gcttacaacg agttacacgc tttggcgag 120
gaattggaga	cgccgttcga agcaccggcg gttcttgtagg tgggacagca gaccgacggt 180
aaaagtgcgc	ttgtggaagc tcttatgggg tttcaattta accatgtcgg cggcggaacc 240
aagactcgtc	ggccgattac tctccatatg aagtacgac ctcagtgtca attcccgtt 300
tgatcatctc	gatctgatga tgatccttcc gtttctcttc ccaaattctc ctcacaaatt 360
caggcatata	ttgaggctga gaacatgagg ctggagcaag agccatgtag cccattctct 420
gcaaaggaga	ttattgtgaa agtccagtat aagtattgtc caaaccttac catcattgat 480
acacctggac	ttattgctcc tgcaccagga ctgaaaaacc gagctcttca ggttcaagca 540
cgggctgtgg	aagctctagt ccgagcaaa atgcaacaca aagagttcat cattttatgc 600
ctcgaagata	gcagtgactg gagcattgca accactcgaa ggatagtgat gcaagttgat 660
cctgagcttt	ctaggacaat tggtgtttct acaaagcttg aactaaaaat ccctcaattc 720

tcatgttcat	ctgacgtgga	agtctttctc	tcacctcctg	caagcgcaact	tgacagctcc	780	
ttattgggcg	attctccttt	tttcacgtct	gtgccttctg	gaagagttgg	ctatggacag	840	
gattcagtgt	ataagtctaa	tgacgagttc	aaacaggctg	tgctacttag	agaaatggaa	900	
gacattgcat	ctttagagaa	gaagttgggc	cgtttactga	caaaacagga	aaagagtagg	960	
attggcatca	gtaaaactgag	gttgtttctg	gaagaactac	tctggaaaag	gtacaaagag	1020	
agtgttccat	tgatcattcc	actgttagga	aaggagtacc	gcagtacagt	cagaaagctg	1080	
gataccttat	cgctgttatt	gaagggaaca	gttggtggccc	ctccagataa	at ttggtgag	1140	
acactgcaag	atgaaaaggac	acaaggagga	gcatttggtg	gtactgatgg	tctccagttt	1200	
tcacataagc	taataccgaa	tgcagggatg	cgtctctatg	ggggtgcaca	atatcaccgt	1260	
gccatggctg	agtttcgttt	tctagttggg	gctatcaa	gtcccccaat	aacgagggag	1320	
gaaattgtaa	atgcatgtgg	agttgaggat	attcatgatg	gaacaaacta	ttccagaaca	1380	
gcttggtgta	tagcagttgc	gaaggctcgt	gagacgtttg	aacctttcct	tcatacagaaa	1440	
gttttttcca	gttctcattt	tcgtttgttt	tgcgttgata	tagttagggg	cgaggcttct	1500	
acacattctc	aagagattgc	ttccaatttc	tgtatatctt	cttcaggtag	gtactgtttt	1560	
ctttggtttg	acggtgaata	tttaagtggg	catgaggtgt	ttctcaagcg	ggttgcttca	1620	
gcattcaaca	gttttggtga	gtccacagaa	aaatcatgtc	gtgacaaatg	tatggaggat	1680	
ttagcaagta	caactcgcta	tggtacatgg	tctcttcaca	acaagaaccg	agctggctcta	1740	
cgtcaattct	tggactcatt	tgggtgaaca	gagcataata	cgacatcagg	taatgccata	1800	
ggatttagtc	ttcccccaaga	tgcattaggt	ggcacaacag	acaccaagtc	aagatcagat	1860	
gtaaaagctaa	gccatctcgc	ctcaaacatc	gattcagggt	ccagtattca	gacaacagaa	1920	
atgcggttgg	ctgatcttct	agatagcaca	ctttggaacc	gcaagcttgc	tccttcctct	1980	
gagagaattg	tgtacgcatt	ggtccaacag	atattccagg	gcatacgaga	gtactttctc	2040	
gcctctgctg	agttaaagt	caactgtttt	cttcta	aatgc	ccatcgttga	taagttacct	2100
gctcttctcc	gggaagagtt	ggaaaacgca	tttgaagacg	acctcgatag	tatcttcgac	2160	
atcacgaatc	tccggcaatc	acttgatcaa	aagaaaacgga	gcacagagat	cgagctcaga	2220	
aggataaaga	ggataaaaaga	gaaattcaga	gtgatgaatg	agaagctaaa	ctctcatgaa	2280	
tttgctcaaa	atctaaaggc	tccttcggtg	cagcattga			2319	

<210> 16  
 <211> 772  
 <212> PRT  
 <213> Arabidopsis thaliana  
 <400> 16

Met Ala Glu Val Ser Ala Lys Ser Val Thr Val Glu Glu Met Ala Glu  
 1 5 10 15  
 Glu Asp Asp Ala Ala Ile Glu Glu Arg Trp Ser Leu Tyr Glu Ala Tyr  
 20 25 30  
 Asn Glu Leu His Ala Leu Ala Gln Glu Leu Glu Thr Pro Phe Glu Ala  
 35 40 45  
 Pro Ala Val Leu Val Val Gly Gln Gln Thr Asp Gly Lys Ser Ala Leu  
 50 55 60  
 Val Glu Ala Leu Met Gly Phe Gln Phe Asn His Val Gly Gly Gly Thr  
 65 70 75 80  
 Lys Thr Arg Arg Pro Ile Thr Leu His Met Lys Tyr Asp Pro Gln Cys  
 85 90 95  
 Gln Phe Pro Leu Cys His Leu Gly Ser Asp Asp Asp Pro Ser Val Ser  
 100 105 110  
 Leu Pro Lys Ser Leu Ser Gln Ile Gln Ala Tyr Ile Glu Ala Glu Asn  
 115 120 125  
 Met Arg Leu Glu Gln Glu Pro Cys Ser Pro Phe Ser Ala Lys Glu Ile  
 130 135 140  
 Ile Val Lys Val Gln Tyr Lys Tyr Cys Pro Asn Leu Thr Ile Ile Asp  
 145 150 155 160  
 Thr Pro Gly Leu Ile Ala Pro Ala Pro Gly Leu Lys Asn Arg Ala Leu  
 165 170 175  
 Gln Val Gln Ala Arg Ala Val Glu Ala Leu Val Arg Ala Lys Met Gln  
 180 185 190  
 His Lys Glu Phe Ile Ile Leu Cys Leu Glu Asp Ser Ser Asp Trp Ser  
 195 200 205  
 Ile Ala Thr Thr Arg Arg Ile Val Met Gln Val Asp Pro Glu Leu Ser  
 210 215 220  
 Arg Thr Ile Val Val Ser Thr Lys Leu Asp Thr Lys Ile Pro Gln Phe  
 225 230 235 240  
 Ser Cys Ser Ser Asp Val Glu Val Phe Leu Ser Pro Pro Ala Ser Ala  
 245 250 255



Leu Asp Ser Ser Leu Leu Gly Asp Ser Pro Phe Phe Thr Ser Val Pro  
 260 265 270

Ser Gly Arg Val Gly Tyr Gly Gln Asp Ser Val Tyr Lys Ser Asn Asp  
 275 280 285

Glu Phe Lys Gln Ala Val Ser Leu Arg Glu Met Glu Asp Ile Ala Ser  
 290 295 300

Leu Glu Lys Lys Leu Gly Arg Leu Leu Thr Lys Gln Glu Lys Ser Arg  
 305 310 315 320

Ile Gly Ile Ser Lys Leu Arg Leu Phe Leu Glu Glu Leu Leu Trp Lys  
 325 330 335

Arg Tyr Lys Glu Ser Val Pro Leu Ile Ile Pro Leu Leu Gly Lys Glu  
 340 345 350

Tyr Arg Ser Thr Val Arg Lys Leu Asp Thr Leu Ser Leu Leu Leu Lys  
 355 360 365

Gly Thr Val Val Ala Pro Pro Asp Lys Phe Gly Glu Thr Leu Gln Asp  
 370 375 380

Glu Arg Thr Gln Gly Gly Ala Phe Val Gly Thr Asp Gly Leu Gln Phe  
 385 390 395 400

Ser His Lys Leu Ile Pro Asn Ala Gly Met Arg Leu Tyr Gly Gly Ala  
 405 410 415

Gln Tyr His Arg Ala Met Ala Glu Phe Arg Phe Leu Val Gly Ala Ile  
 420 425 430

Lys Cys Pro Pro Ile Thr Arg Glu Glu Ile Val Asn Ala Cys Gly Val  
 435 440 445

Glu Asp Ile His Asp Gly Thr Asn Tyr Ser Arg Thr Ala Cys Val Ile  
 450 455 460

Ala Val Ala Lys Ala Arg Glu Thr Phe Glu Pro Phe Leu His Gln Lys  
 465 470 475 480

Val Phe Ser Ser Ser His Phe Arg Leu Phe Cys Val Asp Ile Val Arg  
 485 490 495

Gly Glu Ala Ser Thr His Ser Gln Glu Ile Ala Ser Asn Phe Cys Ile

500					505					510					
Ser	Ser	Ser	Gly	Arg	Tyr	Cys	Phe	Leu	Trp	Phe	Asp	Gly	Glu	Tyr	Leu
		515					520					525			
Ser	Gly	His	Glu	Val	Phe	Leu	Lys	Arg	Val	Ala	Ser	Ala	Phe	Asn	Ser
	530					535					540				
Phe	Val	Glu	Ser	Thr	Glu	Lys	Ser	Cys	Arg	Asp	Lys	Cys	Met	Glu	Asp
545					550					555					560
Leu	Ala	Ser	Thr	Thr	Arg	Tyr	Val	Thr	Trp	Ser	Leu	His	Asn	Lys	Asn
				565					570					575	
Arg	Ala	Gly	Leu	Arg	Gln	Phe	Leu	Asp	Ser	Phe	Gly	Gly	Thr	Glu	His
			580					585					590		
Asn	Thr	Thr	Ser	Gly	Asn	Ala	Ile	Gly	Phe	Ser	Leu	Pro	Gln	Asp	Ala
		595					600					605			
Leu	Gly	Gly	Thr	Thr	Asp	Thr	Lys	Ser	Arg	Ser	Asp	Val	Lys	Leu	Ser
	610					615					620				
His	Leu	Ala	Ser	Asn	Ile	Asp	Ser	Gly	Ser	Ser	Ile	Gln	Thr	Thr	Glu
625					630					635					640
Met	Arg	Leu	Ala	Asp	Leu	Leu	Asp	Ser	Thr	Leu	Trp	Asn	Arg	Lys	Leu
				645					650					655	
Ala	Pro	Ser	Ser	Glu	Arg	Ile	Val	Tyr	Ala	Leu	Val	Gln	Gln	Ile	Phe
			660					665					670		
Gln	Gly	Ile	Arg	Glu	Tyr	Phe	Leu	Ala	Ser	Ala	Glu	Leu	Lys	Phe	Asn
		675					680					685			
Cys	Phe	Leu	Leu	Met	Pro	Ile	Val	Asp	Lys	Leu	Pro	Ala	Leu	Leu	Arg
	690					695					700				
Glu	Glu	Leu	Glu	Asn	Ala	Phe	Glu	Asp	Asp	Leu	Asp	Ser	Ile	Phe	Asp
705					710					715					720
Ile	Thr	Asn	Leu	Arg	Gln	Ser	Leu	Asp	Gln	Lys	Lys	Arg	Ser	Thr	Glu
				725					730					735	
Ile	Glu	Leu	Arg	Arg	Ile	Lys	Arg	Ile	Lys	Glu	Lys	Phe	Arg	Val	Met
			740					745					750		

Asn Glu Lys Leu Asn Ser His Glu Phe Ala Gln Asn Leu Lys Ala Pro  
755 760 765

Ser Val Gln His  
770

<210> 17  
<211> 841  
<212> PRT  
<213> Arabidopsis thaliana

<400> 17

Met Gln Glu Leu Tyr Thr Asn Arg Thr Val Leu Asn Arg Pro Arg Phe  
1 5 10 15

Ala Val Asn Val Arg Pro Thr Arg Leu Lys Arg Asn Gln Gln Ser Gln  
20 25 30

Ser Lys Met Gln Ser His Ser Lys Asp Pro Ile Asn Ala Glu Ser Arg  
35 40 45

Ser Arg Phe Glu Ala Tyr Asn Arg Leu Gln Ala Ala Val Ala Phe  
50 55 60

Gly Glu Lys Leu Pro Ile Pro Glu Ile Val Ala Ile Gly Gly Gln Ser  
65 70 75 80

Asp Gly Lys Ser Ser Leu Leu Glu Ala Leu Leu Gly Phe Arg Phe Asn  
85 90 95

Val Arg Glu Val Glu Met Gly Thr Arg Arg Pro Leu Ile Leu Gln Met  
100 105 110

Val His Asp Leu Ser Ala Leu Glu Pro Arg Cys Arg Phe Gln Ile Ser  
115 120 125

Arg Ile Phe Phe Val Glu Leu Ala Ile Leu Ile Thr Asp Leu Asp Glu  
130 135 140

Asp Ser Glu Glu Tyr Gly Ser Pro Ile Val Ser Ala Thr Ala Val Ala  
145 150 155 160

Asp Val Ile Arg Ser Arg Thr Glu Ala Leu Leu Lys Lys Thr Lys Thr  
165 170 175

Ala Val Ser Pro Lys Pro Ile Val Met Arg Ala Glu Tyr Ala His Cys  
180 185 190

Pro Asn Leu Thr Ile Ile Asp Thr Pro Gly Phe Val Leu Lys Ala Lys  
 195 200 205

Lys Gly Glu Pro Glu Thr Thr Pro Asp Glu Ile Leu Ser Met Val Lys  
 210 215 220

Ser Leu Ala Ser Pro Pro His Arg Ile Leu Leu Phe Leu Gln Gln Ser  
 225 230 235 240

Ser Val Glu Trp Cys Ser Ser Leu Trp Leu Asp Ala Val Arg Glu Ile  
 245 250 255

Asp Ser Ser Phe Arg Arg Thr Ile Val Val Val Ser Lys Phe Asp Asn  
 260 265 270

Arg Leu Lys Glu Phe Ser Asp Arg Gly Glu Val Asp Arg Tyr Leu Ser  
 275 280 285

Ala Ser Gly Tyr Leu Gly Glu Asn Thr Arg Pro Tyr Phe Val Ala Leu  
 290 295 300

Pro Lys Asp Arg Ser Thr Ile Ser Asn Asp Glu Phe Arg Arg Gln Ile  
 305 310 315 320

Ser Gln Val Asp Thr Glu Val Ile Arg His Leu Arg Glu Gly Val Lys  
 325 330 335

Gly Gly Phe Asp Glu Glu Lys Phe Arg Ser Cys Ile Gly Phe Gly Ser  
 340 345 350

Leu Arg Asp Phe Leu Glu Ser Glu Leu Gln Lys Arg Tyr Lys Glu Ala  
 355 360 365

Ala Pro Ala Thr Leu Ala Leu Leu Glu Glu Arg Cys Ser Glu Val Thr  
 370 375 380

Asp Asp Met Leu Arg Met Asp Met Lys Ile Gln Ala Thr Ser Asp Val  
 385 390 395 400

Ala His Leu Arg Lys Ala Ala Met Leu Tyr Thr Ala Ser Ile Ser Asn  
 405 410 415

His Val Gly Ala Leu Ile Asp Gly Ala Ala Asn Pro Ala Pro Glu Gln  
 420 425 430

Trp Gly Lys Thr Thr Glu Glu Glu Arg Gly Glu Ser Gly Ile Gly Ser  
 435 440 445

Trp Pro Gly Val Ser Val Asp Ile Lys Pro Pro Asn Ala Val Leu Lys  
 450 455 460  
 Leu Tyr Gly Gly Ala Ala Phe Glu Arg Val Ile His Glu Phe Arg Cys  
 465 470 475 480  
 Ala Ala Tyr Ser Ile Glu Cys Pro Pro Val Ser Arg Glu Lys Val Ala  
 485 490 495  
 Asn Ile Leu Leu Ala His Ala Gly Arg Gly Gly Gly Arg Gly Val Thr  
 500 505 510  
 Glu Ala Ser Ala Glu Ile Ala Arg Thr Ala Ala Arg Ser Trp Leu Ala  
 515 520 525  
 Pro Leu Leu Asp Thr Ala Cys Asp Arg Leu Ala Phe Val Leu Gly Ser  
 530 535 540  
 Leu Phe Glu Ile Ala Leu Glu Arg Asn Leu Asn Gln Asn Ser Glu Tyr  
 545 550 555 560  
 Glu Lys Lys Thr Glu Asn Met Asp Gly Tyr Val Gly Phe His Ala Ala  
 565 570 575  
 Val Arg Asn Cys Tyr Ser Arg Phe Val Lys Asn Leu Ala Lys Gln Cys  
 580 585 590  
 Lys Gln Leu Val Arg His His Leu Asp Ser Val Thr Ser Pro Tyr Ser  
 595 600 605  
 Met Ala Cys Tyr Glu Asn Asn Tyr His Gln Gly Gly Ala Phe Gly Ala  
 610 615 620  
 Tyr Asn Lys Phe Asn Gln Ala Ser Pro Asn Ser Phe Cys Phe Glu Leu  
 625 630 635 640  
 Ser Asp Thr Ser Arg Asp Glu Pro Met Lys Asp Gln Glu Asn Ile Pro  
 645 650 655  
 Pro Glu Lys Asn Asn Gly Gln Glu Thr Thr Pro Gly Lys Gly Gly Glu  
 660 665 670  
 Ser His Ile Thr Val Pro Glu Thr Pro Ser Pro Asp Gln Pro Cys Glu  
 675 680 685  
 Ile Val Tyr Gly Leu Val Lys Lys Glu Ile Gly Asn Gly Pro Asp Gly

690	695	700
Val Gly Ala Arg Lys	Arg Met Ala Arg Met	Val Gly Asn Arg Asn Ile
705	710	715 720
Glu Pro Phe Arg Val	Gln Asn Gly Gly Leu Met	Phe Ala Asn Ala Asp
	725	730 735
Asn Gly Met Lys Ser Ser Ser	Ala Tyr Ser Glu Ile Cys Ser Ser Ala	
	740 745	750
Ala Gln His Phe Ala Arg Ile	Arg Glu Val Leu Val Glu Arg Ser Val	
	755 760	765
Thr Ser Thr Leu Asn Ser Gly Phe Leu Thr Pro Cys Arg Asp Arg Leu		
770	775	780
Val Val Ala Leu Gly Leu Asp Leu Phe Ala Val Asn Asp Asp Lys Phe		
785	790	795 800
Met Asp Met Phe Val Ala Pro Gly Ala Ile Val Val Leu Gln Asn Glu		
	805	810 815
Arg Gln Gln Leu Gln Lys Arg Gln Lys Ile Leu Gln Ser Cys Leu Thr		
	820	825 830
Glu Phe Lys Thr Val Ala Arg Ser Leu		
	835	840
<210> 18		
<211> 817		
<212> PRT		
<213> Arabidopsis thaliana		
<400> 18		
Met Ala Asn Ser Asn Thr Tyr Leu Thr Thr Pro Thr Lys Thr Pro Ser		
1	5	10 15
Ser Arg Arg Asn Gln Gln Ser Gln Ser Lys Met Gln Ser His Ser Lys		
	20	25 30
Asp Pro Ile Asn Ala Glu Ser Arg Ser Arg Phe Glu Ala Tyr Asn Arg		
	35	40 45
Leu Gln Ala Ala Ala Val Ala Phe Gly Glu Lys Leu Pro Ile Pro Glu		
	50	55 60

Ile Val Ala Ile Gly Gly Gln Ser Asp Gly Lys Ser Ser Leu Leu Glu  
 65 70 75 80  
 Ala Leu Leu Gly Phe Arg Phe Asn Val Arg Glu Val Glu Met Gly Thr  
 85 90 95  
 Arg Arg Pro Leu Ile Leu Gln Met Val His Asp Leu Ser Ala Leu Glu  
 100 105 110  
 Pro Arg Cys Arg Phe Gln Asp Glu Asp Ser Glu Glu Tyr Gly Ser Pro  
 115 120 125  
 Ile Val Ser Ala Thr Ala Val Ala Asp Val Ile Arg Ser Arg Thr Glu  
 130 135 140  
 Ala Leu Leu Lys Lys Thr Lys Thr Ala Val Ser Pro Lys Pro Ile Val  
 145 150 155 160  
 Met Arg Ala Glu Tyr Ala His Cys Pro Asn Leu Thr Ile Ile Asp Thr  
 165 170 175  
 Pro Gly Phe Val Leu Lys Ala Lys Lys Gly Glu Pro Glu Thr Thr Pro  
 180 185 190  
 Asp Glu Ile Leu Ser Met Val Lys Ser Leu Ala Ser Pro Pro His Arg  
 195 200 205  
 Ile Leu Leu Phe Leu Gln Gln Ser Ser Val Glu Trp Cys Ser Ser Leu  
 210 215 220  
 Trp Leu Asp Ala Val Arg Glu Ile Asp Ser Ser Phe Arg Arg Thr Ile  
 225 230 235 240  
 Val Val Val Ser Lys Phe Asp Asn Arg Leu Lys Glu Phe Ser Asp Arg  
 245 250 255  
 Gly Glu Val Asp Arg Tyr Leu Ser Ala Ser Gly Tyr Leu Gly Glu Asn  
 260 265 270  
 Thr Arg Pro Tyr Phe Val Ala Leu Pro Lys Asp Arg Ser Thr Ile Ser  
 275 280 285  
 Asn Asp Glu Phe Arg Arg Gln Ile Ser Gln Val Asp Thr Glu Val Ile  
 290 295 300  
 Arg His Leu Arg Glu Gly Val Lys Gly Gly Phe Asp Glu Glu Lys Phe  
 305 310 315 320

Arg Ser Cys Ile Gly Phe Gly Ser Leu Arg Asp Phe Leu Glu Ser Glu  
325 330 335

Leu Gln Lys Arg Tyr Lys Glu Ala Ala Pro Ala Thr Leu Ala Leu Leu  
340 345 350

Glu Glu Arg Cys Ser Glu Val Thr Asp Asp Met Leu Arg Met Asp Met  
355 360 365

Lys Ile Gln Ala Thr Ser Asp Val Ala His Leu Arg Lys Ala Ala Met  
370 375 380

Leu Tyr Thr Ala Ser Ile Ser Asn His Val Gly Ala Leu Ile Asp Gly  
385 390 395 400

Ala Ala Asn Pro Ala Pro Glu Gln Trp Gly Lys Thr Thr Glu Glu Glu  
405 410 415

Arg Gly Glu Ser Gly Ile Gly Ser Trp Pro Gly Val Ser Val Asp Ile  
420 425 430

Lys Pro Pro Asn Ala Val Leu Lys Leu Tyr Gly Gly Ala Ala Phe Glu  
435 440 445

Arg Val Ile His Glu Phe Arg Cys Ala Ala Tyr Ser Ile Glu Cys Pro  
450 455 460

Pro Val Ser Arg Glu Lys Val Ala Asn Ile Leu Leu Ala His Ala Gly  
465 470 475 480

Arg Gly Gly Gly Arg Gly Val Thr Glu Ala Ser Ala Glu Ile Ala Arg  
485 490 495

Thr Ala Ala Arg Ser Trp Leu Ala Pro Leu Leu Asp Thr Ala Cys Asp  
500 505 510

Arg Leu Ala Phe Val Leu Gly Ser Leu Phe Glu Ile Ala Leu Glu Arg  
515 520 525

Asn Leu Asn Gln Asn Ser Glu Tyr Glu Lys Lys Thr Glu Asn Met Asp  
530 535 540

Gly Tyr Val Gly Phe His Ala Ala Val Arg Asn Cys Tyr Ser Arg Phe  
545 550 555 560

Val Lys Asn Leu Ala Lys Gln Cys Lys Gln Leu Val Arg His His Leu



-41-

Leu

<210> 19  
<211> 4283  
<212> DNA  
<213> *Arabidopsis thaliana*

<400> 19  
ttcatgttct tagaagttct aaattttgat catctcttat ttgaaagctc aactaaaata 60  
gctatgatat cattccctga tgctacgtac taggttttta aattcataca cacacaaatc 120  
tataattaaa acttggttaa ttcatacaca caaaggacaa atcttcttcg tattaaaaaa 180  
gatggaggct ctggaacatc tagtggtgcc gtatcactta cttgactggt tcaagccggt 240  
tgtctttggt tggaagaagt aaatttaatt gtgggagagg gatttcacga atttaaactc 300  
gtttttctcc cttttcgtgg tatactttgg accttttgga tatgaacaca tatgtgaaaa 360  
cgttaattca tgtgtttgaa aagtaattaa tcgcgccgtc cgtcttatag ctttgggatg 420  
ggccaatagg atatttaaga gataagaaaa ctaatcagaa acacagacga aggtatctca 480  
ctctctctct ttctctctcc atgagaactc taatctctca ccggcaatgt gtgacgtcac 540  
cgtttcttat ctccgccga tctccaccgt ttctggccg gtgctttaag ttatcctcct 600  
ttactctcc acgtcatagg cgtttttctt ctctctcgat cagaaacatt tcgcatgaat 660  
ccgccgatca gacttcttct tctaggccgc gaactcttta tctggtggt tacaagcgtc 720  
ccgaactcgc cgttcccgtt ttacttctcc ggctagacgc cgacgaggtt atgagcggga 780  
atcgtgaaga gactcttgat ttggtcgacc gtgctttagc taaatcgggt caaatcgtcg 840  
tgattgatgg cggagccacc gctggtgaag tctacgaggc ggcttggttg ctgaaatcac 900  
ttgtcaaagg ccgtgcttac ctcttgatcg ctgaacgtgt tgatatcgcc tccgccgttg 960  
gtgctagtggt tgttgctctc tccgacgaag gtaacaactg atttcattca gttttagcat 1020  
ttaatttctc atagagtgag ttttgtctct caatgctatg tacaggctct ccggcgattg 1080  
tggcgagaaa cacattgatg ggatccaacc ccgactcgggt acttcttcca ctggtagctc 1140  
ggattgtgaa ggatgttgat tctgctctaa ttgcctcaag ctccgaggggt gctgatttcc 1200  
ttatacttgg atctggtgaa gaagatacgc aagtggcgga ttctttgttg aagagcgtga 1260  
aaataccgat atatgtgact tgcagaggca atgaagaagc taaagaagaa ttgcagttac 1320  
tgaaatcagg tgtttctggt tttgttattt cgttgaaaga tttgcgttct tctagggatg 1380  
tagctcttcg ccagagtctt gatggagctt atgttgtaaa taatcatgag acacaaaata 1440  
tgaatgaact gccggagaaa aagaattctg ctggcttcat aaaattagag gacaaacaga 1500  
aactaatagt agaaatggag aaatctgtgt tgagagagac gattgaaatc atccacaagg 1560

cggctccact	ggtgattttt	atttcaaaca	tttggtagtt	gaagtcaatt	ttttgaaatg	1620
gttctaagta	ggtttttgtg	tggttataat	atggtttcat	ttactttctt	gactattttt	1680
cattaacaga	tggaggaagt	ctcccttcta	attgatgctg	tttctcggat	cgatgagccg	1740
tttctgatgg	ttatagtgg	aattctgcac	tcaactccgt	caaattgtga	ttccaggaat	1800
ttgcattgg	attagctcta	tattcattcc	agaaacattt	tagttacaca	cttttgccag	1860
cactagatag	cttgagatac	aatgggcatg	cttctagtca	cttgtccttt	agtgtttctc	1920
aatatcttct	ttcgtcgcct	atgactatga	tgtttcgctt	cttcttttgt	tctgtctatg	1980
cttctcttct	taatttgctt	atggatctgg	ttgtaaggga	actgcatatt	tcttaactgt	2040
accatctgct	tgtgtacata	gttttttcgc	tttcttgtga	cttgtgagta	tgccgttctt	2100
ggaagatggt	ttaagtggga	caagttgcct	ttatgattca	aaatagtttt	tgtatggata	2160
attaattgga	atccacaatt	tgctggtact	agggggaatt	taactctgga	aaatcaacgg	2220
ttatcaatgc	acttcttggg	aagagatacc	tgaaagaagg	ggtagtcccc	actaccaatg	2280
aaatcacgtt	tctgtgctac	tctgacttgg	aatccgaaga	gcaacaacgt	tgccaaacac	2340
atccagatgg	ccaatatgta	tgctatcttc	ctgcaccaat	acttaaggat	gtgagtaatt	2400
caaaattcta	ccatcgcagt	cctgaatttt	tactaattat	ttggaggaat	tgatttgggt	2460
tgttctcctt	tcgagcagat	aaatattggt	gacacacctg	ggaccaatgt	gatccttcaa	2520
aggcaacagc	gtcttacaga	agaatttggt	ccacgtgcag	atttgcttgt	ttttgttctt	2580
tctgctgacc	gccctttaac	tgaaagtgag	gtagaagtta	ccgttttact	tggcatgtta	2640
gttggtgttg	tttttgctca	atatgtatct	gcctaagtag	cttggttagat	ctattttttca	2700
cgaaagtagt	tagttaagtc	atgtatagac	catcaagacc	ttgtgtaggg	aagggaaagt	2760
tgtcactagg	ttgaatgcat	atatcaagg	tttgttgatt	ataaatttaa	actagactaa	2820
tttattttca	aagtaatgag	tgttatagct	attgctggaa	ccagtatgtc	ctgttggtcc	2880
atattttgg	aaagcttagg	ccaatacatt	tgagaggtga	gttgttattg	gtacagcaaa	2940
actgatttta	cgtccatggc	aaattgtatg	taaatgatca	tctacgaagt	actaacctta	3000
tgaatatttg	gttcttattt	tgaaaatctg	aaaaagtttc	aaaagaagga	ataagcttct	3060
caatgtcatc	atacccatgt	catttctatc	tctacctctg	gagcttcctg	ctgtcttgat	3120
tttactgtag	gctgatttac	atctcattgc	gtttgtcagg	ttgcgtttct	ccggtacaca	3180
cagcagtgg	aaaagaaaat	tgtgtttatt	ctgaataaat	ctgatatcta	tcgtgatgct	3240
cgtgagggtt	atcagaaaca	atatttatgt	cttttccttg	atagtctctg	taattgctgg	3300
atttttcttg	actaaagatt	aattttactg	ctgcagcttg	aggaagctat	ttcatttggt	3360
aaagagaata	cacggaagtt	gcttaataca	gaaaatgtga	tattgtatcc	ggtgtccgca	3420

cggctctgctc	ttgaggcgaa	gctttcaaca	gcttcttttg	ttggcagaga	tgatcttgag	3480
atcgcagatc	ctggttctaa	ttggagagtc	cagagcttca	atgaacttga	gaaatttctt	3540
tatagcttct	tggatagctc	aacagctacc	gggatggaga	gaataaggct	taaattggag	3600
acacccatgg	cgattgctga	gcgtctcctt	tcttctgtgg	aagctcttgt	gagacaagat	3660
tgcctagctg	ctaggaaga	cttggcttca	gcagacaaga	ttatcagtcg	aactaaagaa	3720
tacgcgctta	agatggaata	tgagagcatt	tcttggagaa	ggcaggctct	ctcgttggtta	3780
taaattctat	tagatattat	cttgttgaat	cacgaaggag	gaaattggat	tgttctaact	3840
tggctttttt	gtgttttgta	ctctggcttt	tatcgcagat	tgataatgcc	agattacaag	3900
ttgttgatct	gataggaact	accctgcgac	tatcaagcct	tgatcttgcg	atctcgtacg	3960
tgttcaaagg	ggaaaaatcg	gcctcagtag	cagctacatc	caaagttcaa	ggtgaaatac	4020
tcgctccagc	actcacaaat	gcgaaagtaa	gtgtgatgct	ttattctttg	agtattggcc	4080
taactgggga	catgttggtc	atatatatga	ggtctgagat	atagtcacta	ttcatgcaga	4140
aagtaaatat	tgtctaacaa	tgtcttggtg	tgacctgatt	gactttacat	ttcactgttt	4200
gcaggaattg	cttgaaaaat	atgctgaatg	gctacaatca	aatactgccc	gtgaaggagg	4260
tctgtctctg	aaatcattcg	aaa				4283

<210> 20  
 <211> 1929  
 <212> DNA  
 <213> Arabidopsis thaliana

<400>	20	
atgagaactc	taatctctca	ccggcaatgt
gtgacgtcac	cgtttcttat	ctccgccgca
		60
tctccaccgt	ttcctggccg	gtgctttaag
ttatcctcct	ttactcctcc	acgtcatagg
		120
cgtttttctt	ctctctcgat	cagaaacatt
tcgcatgaat	ccgccgatca	gacttcttct
		180
tctaggccgc	gaactcttta	tcttgggtgt
tacaagcgtc	ccgaactcgc	cgttcccgggt
		240
ttacttctcc	ggctagacgc	cgacgaggtt
atgagcgggg	atcgtgaaga	gactcttgat
		300
ttgggtcgacc	gtgcttttagc	taaatcggtt
caaatcgctc	tgattgatgg	cggagccacc
		360
gctggtaagc	tctacgaggc	ggcttgtttg
ctgaaatcac	ttgtcaaagg	ccgtgcttac
		420
ctcttgatcg	ctgaacgtgt	tgatatcgcc
tccgccgttg	gtgctagtgg	tgttgctctc
		480
tccgacgaag	gtcttccggc	gattgtggcg
agaaacacat	tgatgggatc	caacccccgac
		540
tcgggtacttc	ttccactgggt	agctcggatt
gtgaaggatg	ttgattctgc	tctaattgcc
		600
tcaagctccg	aggggtgctga	tttccttata
cttggatctg	gtgaagaaga	tacgcaagtg
		660
gcggattctt	tgttgaagag	cgtgaaaata
ccgatatatg	tgacttgacg	aggcaatgaa
		720
gaagctaaaag	aagaattgca	gttactgaaa
tcagggtgttt	ctgggttttgt	tatttcgttg
		780

```

aaagatttgc gttcttctag ggatgtagct cttcgccaga gtcttgatgg agcttatgtt      840
gtaaaataatc atgagacaca aaatatgaat gaactgccgg agaaaaagaa ttctgctggc      900
ttcataaaat tagaggacaa acagaaacta atagtagaaa tggagaaatc tgtgttgaga      960
gagacgattg aaatcatcca caaggcggct ccactgatgg aggaagtctc ctttctaatt     1020
gatgctgttt ctcggatcga tgagccgttt ctgatggtta tagtggggga atttaactct     1080
ggaaaatcaa cggttatcaa tgcacttctt gggaagagat acctgaaaga aggggtagtc     1140
cccactacca atgaaatcac gtttctgtgc tactctgact tggaatccga agagcaacaa     1200
cgttgccaaa cacatccaga tggccaatat gtatgctatc ttcttgcacc aataacttaag     1260
gatataaata ttgttgacac acctgggacc aatgtgatcc ttcaaaggca acagcgtctt     1320
acagaagaat ttgttccacg tgcagatttg cttgtttttg ttcttttctgc tgaccgccct     1380
- - - - - ttaactgaaa-gtgaggttgc-gtttctccgg tacacacagc agtggaaaaa gaaatttgtg     1440-
tttattctga ataaatctga tatctatcgt gatgctcgtg agcttgagga agctatttca     1500
tttggttaaag agaatacacg gaagttgctt aatacagaaa atgtgatatt gtatccgggtg     1560
tccgcacggg ctgctcttga ggcgaagctt tcaacagctt ctttggttgg cagagatgat     1620
cttgagatcg cagatcctgg ttctaattgg agagtccaga gcttcaatga acttgagaaa     1680
tttctttata gcttcttggg tagctcaaca gctaccggga tggagagaat aaggcttaaa     1740
ttggagacac ccatggcgat tgctgagcgt ctcttttctt ctgtggaagc tcttgtgaga     1800
caagattgcc tagctgctag ggaagacttg gcttcagcag acaagattat cagtcgaact     1860
aaagaatacg cgcttaagat ggaatatgag agcatttctt ggagaaggca ggctctctcg     1920
ttggtataaa                                         1929

```

```

<210> 21
<211> 642
<212> PRT
<213> Arabidopsis thaliana

```

```
<400> 21
```

```
Met Arg Thr Leu Ile Ser His Arg Gln Cys Val Thr Ser Pro Phe Leu
1           5           10           15
```

```
Ile Ser Ala Ala Ser Pro Pro Phe Pro Gly Arg Cys Phe Lys Leu Ser
          20           25           30
```

```
Ser Phe Thr Pro Pro Arg His Arg Arg Phe Ser Ser Leu Ser Ile Arg
          35           40           45
```

```
Asn Ile Ser His Glu Ser Ala Asp Gln Thr Ser Ser Ser Arg Pro Arg
50           55           60
```

Thr Leu Tyr Pro Gly Gly Tyr Lys Arg Pro Glu Leu Ala Val Pro Gly  
 65 70 75 80  
 Leu Leu Leu Arg Leu Asp Ala Asp Glu Val Met Ser Gly Asn Arg Glu  
 85 90 95  
 Glu Thr Leu Asp Leu Val Asp Arg Ala Leu Ala Lys Ser Val Gln Ile  
 100 105 110  
 Val Val Ile Asp Gly Gly Ala Thr Ala Gly Lys Leu Tyr Glu Ala Ala  
 115 120 125  
 Cys Leu Leu Lys Ser Leu Val Lys Gly Arg Ala Tyr Leu Leu Ile Ala  
 130 135 140  
 Glu Arg Val Asp Ile Ala Ser Ala Val Gly Ala Ser Gly Val Ala Leu  
 145 150 155 160  
 Ser Asp Glu Gly Leu Pro Ala Ile Val Ala Arg Asn Thr Leu Met Gly  
 165 170 175  
 Ser Asn Pro Asp Ser Val Leu Leu Pro Leu Val Ala Arg Ile Val Lys  
 180 185 190  
 Asp Val Asp Ser Ala Leu Ile Ala Ser Ser Ser Glu Gly Ala Asp Phe  
 195 200 205  
 Leu Ile Leu Gly Ser Gly Glu Glu Asp Thr Gln Val Ala Asp Ser Leu  
 210 215 220  
 Leu Lys Ser Val Lys Ile Pro Ile Tyr Val Thr Cys Arg Gly Asn Glu  
 225 230 235 240  
 Glu Ala Lys Glu Glu Leu Gln Leu Leu Lys Ser Gly Val Ser Gly Phe  
 245 250 255  
 Val Ile Ser Leu Lys Asp Leu Arg Ser Ser Arg Asp Val Ala Leu Arg  
 260 265 270  
 Gln Ser Leu Asp Gly Ala Tyr Val Val Asn Asn His Glu Thr Gln Asn  
 275 280 285  
 Met Asn Glu Leu Pro Glu Lys Lys Asn Ser Ala Gly Phe Ile Lys Leu  
 290 295 300  
 Glu Asp Lys Gln Lys Leu Ile Val Glu Met Glu Lys Ser Val Leu Arg

305	310	315	320
Glu Thr Ile Glu Ile Ile His Lys Ala Ala Pro Leu Met Glu Glu Val	325	330	335
Ser Leu Leu Ile Asp Ala Val Ser Arg Ile Asp Glu Pro Phe Leu Met	340	345	350
Val Ile Val Gly Glu Phe Asn Ser Gly Lys Ser Thr Val Ile Asn Ala	355	360	365
Leu Leu Gly Lys Arg Tyr Leu Lys Glu Gly Val Val Pro Thr Thr Asn	370	375	380
Glu Ile Thr Phe Leu Cys Tyr Ser Asp Leu Glu Ser Glu Glu Gln Gln	385	390	400
Arg Cys Gln Thr His Pro Asp Gly Gln Tyr Val Cys Tyr Leu Pro Ala	405	410	415
Pro Ile Leu Lys Asp Ile Asn Ile Val Asp Thr Pro Gly Thr Asn Val	420	425	430
Ile Leu Gln Arg Gln Gln Arg Leu Thr Glu Glu Phe Val Pro Arg Ala	435	440	445
Asp Leu Leu Val Phe Val Leu Ser Ala Asp Arg Pro Leu Thr Glu Ser	450	455	460
Glu Val Ala Phe Leu Arg Tyr Thr Gln Gln Trp Lys Lys Lys Phe Val	465	470	480
Phe Ile Leu Asn Lys Ser Asp Ile Tyr Arg Asp Ala Arg Glu Leu Glu	485	490	495
Glu Ala Ile Ser Phe Val Lys Glu Asn Thr Arg Lys Leu Leu Asn Thr	500	505	510
Glu Asn Val Ile Leu Tyr Pro Val Ser Ala Arg Ser Ala Leu Glu Ala	515	520	525
Lys Leu Ser Thr Ala Ser Leu Val Gly Arg Asp Asp Leu Glu Ile Ala	530	535	540
Asp Pro Gly Ser Asn Trp Arg Val Gln Ser Phe Asn Glu Leu Glu Lys	545	550	555
			560

Phe Leu Tyr Ser Phe Leu Asp Ser Ser Thr Ala Thr Gly Met Glu Arg  
565 570 575

Ile Arg Leu Lys Leu Glu Thr Pro Met Ala Ile Ala Glu Arg Leu Leu  
580 585 590

Ser Ser Val Glu Ala Leu Val Arg Gln Asp Cys Leu Ala Ala Arg Glu  
595 600 605

Asp Leu Ala Ser Ala Asp Lys Ile Ile Ser Arg Thr Lys Glu Tyr Ala  
610 615 620

Leu Lys Met Glu Tyr Glu Ser Ile Ser Trp Arg Arg Gln Ala Leu Ser  
625 630 635 640

Leu Val

<210> 22  
<211> 6060  
<212> DNA  
<213> Arabidopsis thaliana

<400> 22  
actgtcacaa agaactagaa aaggcaagca aaactcaact atgtcaaaaag tgtcacttag 60  
attgattctt gaatagcgag acgaagtatc tgggaaaata cggtagtgaa ttaacatctc 120  
cgtagatca taggttcgga ttgaacagat gacacaatta aacaatgatg aagatcaaga 180  
cactttaatc gactgaattc tagttagaac ttagactaaa agtatttaac acttgaagct 240  
caccacttct cgaatatctt gttccaatcg ttttgatgtg gttccggcac tcaagtctctg 300  
tattgttttc aagctgactt tatcagtttt ctgaagtaag tcatatgtgt ctatgcccaa 360  
ttgcgttttt gaattgacat atgttggcca tttgttttcg aatgatttca gagacagact 420  
cccttcacgg gcagtatttg attgtagcca ttcagcatat tttccaagca attcctgcaa 480  
acagtgaaat gtaaagtcaa tcaggtcaca acaagacatt gttagacaat atttactttc 540  
tgcataaata gtgactatat ctgagacctc atatatatga ccaacatgtc cccagttagg 600  
ccaataactca aagaataaag catcacactt actttcgcat ttgtgagtgc tggagcgagt 660  
atttcacctt gaactttgga ttagctgtgt actgaggccg atttttcccc tttgaacacg 720  
tacgagatcg caagatcaag gcttgatagt cgcagggtag ttcctatcag atcaacaact 780  
tgtaatctgg cattatcaat ctgagataaa agccagagta caaacacaaa aaaagccaag 840  
ttagaacaat ccaatttcct ccttcgtgat tcaacaagat aatatctaata agaatttata 900  
ccaacgagag agcctgcctt ctccaagaaa tgctctcata ttccatctta agcgcgtatt 960



ctttagttcg	actgataatc	ttgtctgctg	aagccaagtc	ttccctagca	gctaggcaat	1020
cttgtctcac	aagagcttcc	acagaagaaa	ggagacgctc	agcaatcgcc	atgggtgtct	1080
ccaatttaag	ccttattctc	tccatcccgg	tagctgttga	gctatccaag	aagctataaa	1140
gaaattttctc	aagttcattg	aagctctgga	ctctccaatt	agaaccagga	tctgcgatct	1200
caagatcatc	tctgccaacc	aaagaagctg	ttgaaaagctt	cgcctcaaga	gcagaccgtg	1260
cggacaccgg	atacaatatc	acattttctg	tattaagcaa	cttccgtgta	ttctctttaa	1320
caaataaaa	agcttcctca	agctgcagca	gtaaaattaa	tcttttagtca	agaaaaatcc	1380
agcaattaca	gagactatca	aggaaaagac	ataaatattg	tttctgataa	acctcacgag	1440
catcacgata	gatatcagat	ttattcagaa	taaacacaaa	tttctttttc	cactgctgtg	1500
tgtaccggag	aaacgcaacc	tgacaaacgc	aatgagatgt	aaatcagcct	acagtaaaat	1560
caagacagca	ggaagctcca	gaggtagaga	tagaaatgac	atgggtatga	tgacattgag	1620
aagcttattc	cttcttttga	aactttttca	gattttcaaa	ataagaacca	aatattcata	1680
aggtagtag	ttcgtagatg	atcatttaca	tacaatttgc	catggacgta	aaatcagttt	1740
tgctgtacca	ataacaactc	acctctcaaa	tgtattggcc	taagctttac	caaaatatgg	1800
accaacagga	catactgggt	ccagcaatag	ctataacact	cattactttg	aaaataaatt	1860
agtctagttt	aaattttataa	tcaacaaaac	cttgatatat	gcattcaacc	tagtgacaac	1920
tttcccttcc	ctacacaagg	tcttgatggg	ctatacatga	cttaactaac	tactttcgtg	1980
aaaaatagat	ctaacaagct	acttaggcag	atacatattg	agcaaaaaca	acaacaacta	2040
acatgccaa	taaaacggta	acttctacct	cactttcagt	taaagggcgg	tcagcagaaa	2100
gaacaaaaac	aagcaaactc	gcacgtggaa	caaattcttc	tgtaagacgc	tgttgccttt	2160
gaaggatcac	attgggtcca	ggtgtgtcaa	caatatttat	ctgctcgaaa	ggagaacaac	2220
ccaaatcaat	tcctccaaat	aattagtaaa	aattcaggac	tgcgatggta	gaattttgaa	2280
ttactcacat	ccttaagtat	tggtgcagga	agatagcata	catattggcc	atctggatgt	2340
gtttggcaac	gttggtgtc	ttcggattcc	aagtcagagt	agcacagaaa	cgtgatttca	2400
ttggtagtgg	ggactacccc	ttctttcagg	tatctcttcc	caagaagtgc	attgataacc	2460
gttgattttc	cagagttaaa	ttccccctag	taccagcaaa	ttgtggattc	caattaatta	2520
tccatacaaa	aactattttg	aatcataaag	gcaacttgtc	ccacttaaaa	catcttccaa	2580
gaacggcata	ctcacaagtc	acaagaaaag	gaaaaaacta	tgtacacaag	cagatgggtac	2640
agttaagaaa	tatgcagttc	ccttacaacc	agatccataa	gcaaattaag	aagagaagca	2700
tagacagaac	aaaagaagaa	gcgaaacatc	atagtcatag	gcgacgaaag	aagatattga	2760
gaagcactaa	aggacaagtg	actagaagca	tgcccattgt	atctcaagct	atctagtgtc	2820

ggcaaaagtg	tgtaactaaa	atgttttctgg	aatgaatata	gagctaatac	caatgcaaat	2880
tcctggaatc	acaatttgac	ggagttgagt	gcagaattac	cactataacc	atcagaaacg	2940
gctcatcgat	ccgagaaaaca	gcatcaatta	gaagggagac	ttcctccatc	tgттаатgaa	3000
aaatagtcga	agaagtaaат	gaaaccatat	tataaccaca	caaaaaccta	cttagaacca	3060
tttcaaaaaa	ttgacttcaa	ctaccaaatg	tttgaaataa	aaatcaccag	tggagccgcc	3120
ttgtggatga	tttcaatcgt	ctctctcaac	acagatttct	ccattttctac	tattagtttc	3180
tgtttgtcct	ctaattttat	gaagccagca	gaattctttt	tctccggcag	ttcattcata	3240
ttttgtgtct	catgattatt	tacaacataa	gctccatcaa	gactctggcg	aagagctaca	3300
tccttagaag	aacgcaaатc	tttcaacgaa	ataacaaaac	cagaaacacc	tgatttcagt	3360
aactgcaatt	cttcttttagc	ttcttcattg	cctctgcaag	tcacatatat	cggtattttc	3420
acgctcttca	acaaagaатc	cgccacttgc	gtatcttctt	caccagatcc	aagtataagg	3480
aaatcagcac	cctcggagct	tgaggcaatt	agagcagaat	caacatcctt	cacaatccga	3540
gctaccagtg	gaagaagtac	cgagtcgggg	ttggatccca	tcaatgtgtt	tctcgccaca	3600
atcgccggaa	gacctgtaca	tagcattgag	agacaaaact	cactctatga	gaaattaaat	3660
gctaaaactg	aatgaaатca	gttgttacct	tcgtcggaga	gagcaacacc	actagcacca	3720
acggcggagg	cgatatcaac	acgttcagcg	atcaagaggt	aagcacggcc	tttgacaagt	3780
gatttcagca	aacaagccgc	ctcgtagagc	ttaccagcgg	tggtcccgcc	atcaatcacg	3840
acgatttgaa	ccgatttagc	taaagcacgg	tcgaccaaат	caagagtctc	ttcacgattc	3900
ccgctcataa	cctcgtcggc	gtctagccgg	agaagtaaac	cgggaacggc	gagttcggga	3960
cgcttgtaac	caccaggata	aagagttcgc	ggcctagaag	aagaagtctg	atcggcggat	4020
tcatgcgaaa	tgtttctgat	cgagagagaa	gaaaaacgcc	tatgacgtgg	aggagtaaag	4080
gaggataact	taaagcaccg	gccaggaaac	ggtggagatg	cggcggagat	aagaaaacgt	4140
gacgtcacac	attgccggtg	agagattaga	gttctcatgg	agagagaaaг	agagagagtг	4200
agataccttc	gtctgtgttt	ctgattagtt	ttcttatctc	ttaaатatcc	tattggccca	4260
tcccaaagtct	ataagacgga	cggcgcgatt	aattactttt	caaacacatg	aattaacgtt	4320
ttcacatatg	tgttcatatc	caaaagggtcc	aaagtatacc	acgaaaaggг	agaaaaacag	4380
atttaaattc	gtgaaатccc	tctcccacaa	ttaaатttac	ttcttccaaa	caaagacaaa	4440
cggcttgaac	cagtcaagta	agtgatacgg	caccactaga	tgttccagag	cctccatctt	4500
ttttaatacg	aagaagattt	gtcctttgtg	tgtatgaatt	taacaagtтt	taattataga	4560
tttgtgtgtg	tatgaattta	aaaacctagt	acgtagcatc	agggaatgat	atcatagcta	4620
ttttagttga	gctttcaaат	aagagatgat	caaaатttag	aacttctaag	aacatgaacg	4680



ccgcgaactc	tttatcctgg	tggttacaag	cgtcccgaac	tcgccgttcc	cggtttactt	360
ctccggctag	acgccgacga	ggttatgagc	gggaatcgtg	aagagactct	tgatttggtc	420
gaccgtgctt	tagctaaatc	ggttcaaatc	gtcgtgattg	atggcggagc	caccgctggt	480
aagctctacg	aggcggcttg	tttgctgaaa	tcacttgta	aaggccgtgc	ttacctcttg	540
atcgctgaac	gtgttgatat	cgcctccgcc	gttggtgcta	gtggtgttgc	tctctccgac	600
gaaggtcttc	cggcgattgt	ggcgagaaac	acattgatgg	gatccaaccc	cgactcggtc	660
cttcttccac	tggtagctcg	gattgtgaag	gatgttgatt	ctgctctaata	tgacctcaagc	720
tccgaggggtg	ctgatttctt	tatacttggc	tctggtgaag	aagatacgca	agtggcggat	780
tctttgttga	agagcgtgaa	aataccgata	tatgtgactt	gcagaggcaa	tgaagaagct	840
aaagaagaat	tgagttact	gaaatcaggt	gtttctgggt	ttgttatttc	gttgaaagat	900
ttgcgttctt	ctagggatgt	agctcttcgc	cagagtcttg	atggagctta	tggtgtaaat	960
aatcatgaga	cacaaaatat	gaatgaactg	ccggagaaaa	agaattctgc	tggttccata	1020
aaattagagg	acaaacagaa	actaatagta	gaaatggaga	aatctgtgtt	gagagagacg	1080
attgaaatca	tccacaaggc	ggctccactg	atggaggaag	tctcccttct	aattgatgct	1140
gtttctcgga	tcgatgagcc	gtttctgatg	gttatagtgg	gggaatttaa	ctctggaaaa	1200
tcaacgggta	tcaatgcact	tcttgggaag	agatacctga	aagaaggggt	agtccccact	1260
accaatgaaa	tcacgtttct	gtgctactct	gacttggaaat	ccgaagagca	acaacgttgc	1320
caaacacatc	cagatggcca	atatataaat	attgttgaca	cacctgggac	caatgtgatc	1380
cttcaaaggc	aacagcgtct	tacagaagaa	tttgttccac	gtgcagattt	gcttgttttt	1440
gttctttctg	ctgaccgccc	tttaactgaa	agtgaggtag	aagttaccgt	tttacttggc	1500
atggaaggga	aagttgtcac	taggttgaat	gcataatca	aggttgcgtt	tctccggtac	1560
acacagcagt	ggaaaaagaa	atttgtgttt	attctgaata	aatctgatat	ctatcgtgat	1620
gctcgtgagc	ttgaggaagc	tatttcattt	gttaaagaga	atacacggaa	gttgcttaat	1680
acagaaaatg	tgatattgta	tccggtgtcc	gcacggtctg	ctcttgaggc	gaagctttca	1740
acagcttctt	tggttggcag	agatgatctt	gagatcgagc	atcctgggtc	taattggaga	1800
gtccagagct	tcaatgaact	tgagaaaattt	ctttatagct	tcttggatag	ctcaacagct	1860
accgggatgg	agagaataag	gcttaaattg	gagacacca	tggcgattgc	tgagcgtctc	1920
ctttcttctg	tggaagctct	tgtgagacaa	gattgcctag	ctgctaggga	agacttggct	1980
tcagcagaca	agattatcag	tcgaactaaa	gaatacgcgc	ttaagatgga	atatgagagc	2040
atttcttgga	gaaggcaggc	tctctcgttg	attgataatg	ccagattaca	agttgttgat	2100
ctgataggaa	ctacctgcg	actatcaagc	cttgatcttg	cgatctcgta	cgtgttcaaa	2160

ggggaaaaaat cggcctcagt agcagctaca tccaaaagttc aaggtgaaat actcgctcca 2220  
 gcactcacaa atgcgaaaaga attgcttgga aaatatgctg aatggctaca atcaaatact 2280  
 gcccgtgaag ggagtctgtc tctgaaatca ttcgaaaaca aatggccaac atatgtcaat 2340  
 tcaaaaaacgc aattggggcat agacacatat gacttacttc agaaaaactga taaagtcagc 2400  
 ttgaaaaacaa tacagaactt gagtgccgga accacatcaa aacgattgga acaagatatt 2460  
 cgagaagtg 2469

<210> 24  
 <211> 823  
 <212> PRT  
 <213> Arabidopsis thaliana

<400> 24

Met Glu Ala Leu Glu His Leu Val Leu Trp Asp Gly Pro Ile Gly Tyr  
 1 5 10 15

Leu Arg Asp Lys Lys Thr Asn Gln Lys His Arg Arg Arg Tyr Leu Thr  
 20 25 30

Leu Ser Leu Ser Leu Ser Met Arg Thr Leu Ile Ser His Arg Gln Cys  
 35 40 45

Val Thr Ser Pro Phe Leu Ile Ser Ala Ala Ser Pro Pro Phe Pro Gly  
 50 55 60

Arg Cys Phe Lys Leu Ser Ser Phe Thr Pro Pro Arg His Arg Arg Phe  
 65 70 75 80

Ser Ser Leu Ser Ile Arg Asn Ile Ser His Glu Ser Ala Asp Gln Thr  
 85 90 95

Ser Ser Ser Arg Pro Arg Thr Leu Tyr Pro Gly Gly Tyr Lys Arg Pro  
 100 105 110

Glu Leu Ala Val Pro Gly Leu Leu Leu Arg Leu Asp Ala Asp Glu Val  
 115 120 125

Met Ser Gly Asn Arg Glu Glu Thr Leu Asp Leu Val Asp Arg Ala Leu  
 130 135 140

Ala Lys Ser Val Gln Ile Val Val Ile Asp Gly Gly Ala Thr Ala Gly  
 145 150 155 160

Lys Leu Tyr Glu Ala Ala Cys Leu Leu Lys Ser Leu Val Lys Gly Arg  
 165 170 175

Ala Tyr Leu Leu Ile Ala Glu Arg Val Asp Ile Ala Ser Ala Val Gly  
 180 185 190  
 Ala Ser Gly Val Ala Leu Ser Asp Glu Gly Leu Pro Ala Ile Val Ala  
 195 200 205  
 Arg Asn Thr Leu Met Gly Ser Asn Pro Asp Ser Val Leu Leu Pro Leu  
 210 215 220  
 Val Ala Arg Ile Val Lys Asp Val Asp Ser Ala Leu Ile Ala Ser Ser  
 225 230 235 240  
 Ser Glu Gly Ala Asp Phe Leu Ile Leu Gly Ser Gly Glu Glu Asp Thr  
 245 250 255  
 Gln Val Ala Asp Ser Leu Leu Lys Ser Val Lys Ile Pro Ile Tyr Val  
 260 265 270  
 Thr Cys Arg Gly Asn Glu Glu Ala Lys Glu Glu Leu Gln Leu Leu Lys  
 275 280 285  
 Ser Gly Val Ser Gly Phe Val Ile Ser Leu Lys Asp Leu Arg Ser Ser  
 290 295 300  
 Arg Asp Val Ala Leu Arg Gln Ser Leu Asp Gly Ala Tyr Val Val Asn  
 305 310 315 320  
 Asn His Glu Thr Gln Asn Met Asn Glu Leu Pro Glu Lys Lys Asn Ser  
 325 330 335  
 Ala Gly Phe Ile Lys Leu Glu Asp Lys Gln Lys Leu Ile Val Glu Met  
 340 345 350  
 Glu Lys Ser Val Leu Arg Glu Thr Ile Glu Ile Ile His Lys Ala Ala  
 355 360 365  
 Pro Leu Met Glu Glu Val Ser Leu Leu Ile Asp Ala Val Ser Arg Ile  
 370 375 380  
 Asp Glu Pro Phe Leu Met Val Ile Val Gly Glu Phe Asn Ser Gly Lys  
 385 390 395 400  
 Ser Thr Val Ile Asn Ala Leu Leu Gly Lys Arg Tyr Leu Lys Glu Gly  
 405 410 415  
 Val Val Pro Thr Thr Asn Glu Ile Thr Phe Leu Cys Tyr Ser Asp Leu

420	425	430
Glu Ser Glu Glu Gln Gln Arg Cys Gln Thr His Pro Asp Gly Gln Tyr 435 440 445		
Ile Asn Ile Val Asp Thr Pro Gly Thr Asn Val Ile Leu Gln Arg Gln 450 455 460		
Gln Arg Leu Thr Glu Glu Phe Val Pro Arg Ala Asp Leu Leu Val Phe 465 470 475 480		
Val Leu Ser Ala Asp Arg Pro Leu Thr Glu Ser Glu Val Glu Val Thr 485 490 495		
Val Leu Leu Gly Met Glu Gly Lys Val Val Thr Arg Leu Asn Ala Tyr 500 505 510		
Ile Lys Val Ala Phe Leu Arg Tyr Thr Gln Gln Trp Lys Lys Lys Phe 515 520 525		
Val Phe Ile Leu Asn Lys Ser Asp Ile Tyr Arg Asp Ala Arg Glu Leu 530 535 540		
Glu Glu Ala Ile Ser Phe Val Lys Glu Asn Thr Arg Lys Leu Leu Asn 545 550 555 560		
Thr Glu Asn Val Ile Leu Tyr Pro Val Ser Ala Arg Ser Ala Leu Glu 565 570 575		
Ala Lys Leu Ser Thr Ala Ser Leu Val Gly Arg Asp Asp Leu Glu Ile 580 585 590		
Ala Asp Pro Gly Ser Asn Trp Arg Val Gln Ser Phe Asn Glu Leu Glu 595 600 605		
Lys Phe Leu Tyr Ser Phe Leu Asp Ser Ser Thr Ala Thr Gly Met Glu 610 615 620		
Arg Ile Arg Leu Lys Leu Glu Thr Pro Met Ala Ile Ala Glu Arg Leu 625 630 635 640		
Leu Ser Ser Val Glu Ala Leu Val Arg Gln Asp Cys Leu Ala Ala Arg 645 650 655		
Glu Asp Leu Ala Ser Ala Asp Lys Ile Ile Ser Arg Thr Lys Glu Tyr 660 665 670		

Ala Leu Lys Met Glu Tyr Glu Ser Ile Ser Trp Arg Arg Gln Ala Leu  
675 680 685

Ser Leu Ile Asp Asn Ala Arg Leu Gln Val Val Asp Leu Ile Gly Thr  
690 695 700

Thr Leu Arg Leu Ser Ser Leu Asp Leu Ala Ile Ser Tyr Val Phe Lys  
705 710 715 720

Gly Glu Lys Ser Ala Ser Val Ala Ala Thr Ser Lys Val Gln Gly Glu  
725 730 735

Ile Leu Ala Pro Ala Leu Thr Asn Ala Lys Glu Leu Leu Gly Lys Tyr  
740 745 750

Ala Glu Trp Leu Gln Ser Asn Thr Ala Arg Glu Gly Ser Leu Ser Leu  
755 760 765

Lys Ser Phe Glu Asn Lys Trp Pro Thr Tyr Val Asn Ser Lys Thr Gln  
770 775 780

Leu Gly Ile Asp Thr Tyr Asp Leu Leu Gln Lys Thr Asp Lys Val Ser  
785 790 795 800

Leu Lys Thr Ile Gln Asn Leu Ser Ala Gly Thr Thr Ser Lys Arg Leu  
805 810 815

Glu Gln Asp Ile Arg Glu Val  
820

<210> 25  
<211> 2037  
<212> DNA  
<213> Arabidopsis thaliana

<400> 25  
acaaagacca gttaaaaacg tgtgtagtat aacttactgg taagtaaagc tataagcaag 60  
aatctgtacc ttattttctc tctctctagt gagccctgac catccgaatt tcgcattcgc 120  
caatcgctgt gtttccgtgt gttttcccc tttttggttt tagatttgcc taaaccaatc 180  
agaacaagag aaacctggaa acaagaacca aaaaaagtgg gctttctctg catcatcatt 240  
ccacttctgg tccccactg aaaaggacaa tccaaaagcta gatcccttca aattttcctt 300  
tttgttttcg aaattttcgc aatttttaat attattttgg aagtctatgt ttctttctga 360  
tcttttagcaa caaaggaagg tggaatctgt ttcacgttta cacaaaaaca tgtcaactgg 420  
agattttctc tttccctaac ttttgaccat acagtatggg ccatacttaa tattctctct 480



ttgttttttaa	taaaaataaaa	ggtttgggta	tcaagcatat	atgtcattag	cttaaagcta	540
tgactttgtt	tagaaaaactt	aggaggacca	tatggcaagc	ttttatacag	tgtagactt	600
ctaacgttaa	ttctaaacaa	tctccagtat	caagcattaa	caaggtttat	tctagcacct	660
ctggattttt	aaaacttctc	gaaccaatcc	ttaactaaaa	aagaaattca	agcgttttat	720
ctttagaaaat	cacagctagc	atatgctgag	aattactctc	catggaaaact	tatactaaga	780
ttgttttttt	ccctcatatt	taagccacta	aagtcaaaag	attagtacat	tgacaactaa	840
gttttagatgc	tctatgcgga	gaatcaattt	catatgaatg	tatcaagcaa	ttcatgaact	900
ctaggagacc	ataaaaatcca	attgacagaa	aaaatgagtc	aactaacata	tttacctgtg	960
atatgaggta	catgtgcagg	tcaaagatca	gaagaaaatt	ttctccatga	gtctcttgag	1020
cttccaactc	atccagcgat	ttgtatcaca	aacaatctga	aaaagaagct	aaaaaacgtt	1080
ataccaaaagt	ttcacgcccc	taatgctatt	gtttggttct	ttcaagaacc	tccecaatct	1140
tttgaattcg	cattcaaaaa	aaccatcagt	gagtccattt	caagtcggaa	ctggcaggta	1200
ttattcatta	tgacaaagta	catacacttg	ccccccactg	aacaatgtca	agaagggaaa	1260
acccgacatt	gtgttggaat	agctaaaagtc	tcatctcgtc	tcgtgatata	tgaaggttat	1320
caatatcaac	ttgtagcaac	tgtaatttac	ttctaataatc	tgataattct	ttctggattc	1380
ctaaaagacg	atcaagtctt	agctgagctt	cttctcgata	aggcttggca	acaatattca	1440
caaagttaac	tagattactc	gtcgcatctg	aaagatcttt	ttgcatagcg	tcttcgagct	1500
gttgagccaa	cgcatacagc	actttattca	ccttaccaat	tatagcctgt	cttcgatatg	1560
ggaagtttgc	tatagccaca	tacctgtcac	atagattatg	ttatgcatac	aaccagtctt	1620
tcttaaaaagt	cataaatatg	cctctagtgt	caagaaaaaa	atacactagg	cgtgatctaa	1680
gaaggtggag	taatgagaca	ttgggaagag	gggaaattta	gagcagtgtt	attaccctcc	1740
agcggagcaa	aggccaagag	caagaagatc	ttccagtgtg	gtcggtagca	ctgaggttag	1800
aagtgatgca	gacagtccctg	cagctccaag	cccaccaact	gtcacaaaaga	actagaaaag	1860
gcaagcaaaa	ctcaactatg	tcaaaagtgt	cacttagatt	gattcttgaa	tagcgagacg	1920
aagtatctgg	gaaaatacgg	tactgaatta	acatctccgt	cagatcatag	gttcggattg	1980
aacagatgac	acaattaaac	aatgatgaag	atcaagacac	tttaatcgac	tgaattc	2037

<210> 26  
 <211> 2097  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 26	aaaaactttt	caaaacttca	tgtgttggtga	aaacaaaagt	tttttggttaa	tgaaaactcg	60
	acaaagacca	gttaaaaacg	tgtgtagtat	aacttactgg	taagtaaagc	tataagcaag	120

aatctgtacc	ttattttctc	tctctctagt	gagcctgae	catccgaatt	tegeattege	180
caatcgctgt	gtttccgtgt	gttttcccc	tttttggttt	tagatttgcc	taaaccaatc	240
agaacaagag	aaacctggaa	acaagaacca	aaaaaagtgg	gctttctctg	catcatcatt	300
ccaatttctg	tccccaaactg	aaaaggacaa	tccaaagcta	gatcccttca	aatttttcctt	360
tttgttttcg	aaattttcgc	aatttttaaat	attatttttg	aagtctatgt	ttctttctga	420
tcttttagcaa	caaaggaagg	tggaatctgt	ttcacgttta	cacaaaaaca	tgtcaactgg	480
agattttctc	tttccctaac	ttttgaccat	acagtatggt	ccataactaa	tattctctct	540
ttgttttttaa	taaaataaaa	ggtttggtta	tcaagcatat	atgtcattag	cttaaagcta	600
tgactttggt	tagaaaactt	aggaggacca	tatggcaagc	ttttatacag	tgtagactt	660
ctaacgttaa	ttctaaacaa	tctccagtat	caagcattaa	caaggtttat	tctagcacct	720
ctggattttt	aaaacttctc	gaaccaatcc	ttaactaaaa	aagaaattca	agcgttttat	780
ctttagaaat	cacagctagc	atatgctgag	aattactctc	catggaaact	tatactaaga	840
ttgttttttt	ccctcatatt	taagccacta	aagtcaaaag	attagtacat	tgacaactaa	900
gttttagatgc	tctatgcgga	gaatcaattt	catatgaatg	tatcaagcaa	ttcatgaact	960
ctaggagacc	ataaaatcca	attgacagaa	aaaatgagtc	aactaacata	tttacctgtg	1020
atatgaggta	catgtgcagg	tcaaagatca	gaagaaaatt	ttctccatga	gtctcttgag	1080
cttccaactc	atccagcgat	ttgtatcaca	aacaatctga	aaaagaagct	aaaaaacgtt	1140
ataccaaagt	ttcacgcca	taatgctatt	gtttggttct	ttcaagaacc	tccccaatct	1200
tttgaattcg	cattcaaaaa	aaccatcagt	gagtcatttt	caagtcggaa	ctggcaggta	1260
ttattcatta	tgacaaagta	catacacttg	ccccccactg	aacaatgtca	agaagggaaa	1320
acccgacatt	gtgttggaat	agctaaagtc	tcatctcgtc	tcgtgatata	tgaaggttat	1380
caatatcaac	ttgtagcaac	tgtaatttac	ttctaataatc	tgataattct	ttctggattc	1440
ctaaaagacg	atcaagtctt	agctgagctt	cttctcgata	aggcttggca	acaatatcca	1500
caaagttaac	tagattactc	gtcgcatctg	aaagatcttt	ttgcatagcg	tcttcgagct	1560
gttgagccaa	cgcacagcc	actttattca	ccttaccaat	tatagcctgt	cttcgatatg	1620
ggaagtttgc	tatagccaca	tacctgtcac	atagattatg	ttatgcatac	aaccagtctt	1680
tcttaaaagt	cataaatatg	cctctagtgt	caagaaaaaa	atacactagg	cgtgatctaa	1740
gaagggtggag	taatgagaca	ttgggaagag	gggaaattta	gagcagtgtt	attaccctcc	1800
agcggagcaa	aggccaagag	caagaagatc	ttccagtgtg	gtcggtagca	ctgagggttag	1860
aagtgatgca	gacagtcttg	cagctccaag	cccaccaact	gtcacaaaga	actagaaaag	1920
gcaagcaaaa	ctcaactatg	tcaaaagtgt	cacttagatt	gattcttgaa	tagcgagacg	1980

aagtatctgg gaaaatacgg tactgaatta acatctccgt cagatcatag gttcggattg 2040  
aacagatgac acaattaaac aatgatgaag atcaagacac tttaatcgac tgaattc 2097

<210> 27  
<211> 6400  
<212> DNA  
<213> Arabidopsis thaliana

<400> 27  
tagttagaac ttagactaaa agtatttaat acttgaagct caccacttct egaatatctt 60  
gttccaatcg ttttgatgtg gttccggcac tcaagttctg tattgttttc aagctgactt 120  
tatcagtttt ctgaagtaag tcatatgtgt ctatgccccaa ttgcgttttt gaattgacat 180  
atgttggcca tttgttttcg aatgatttca gagacagact cccttcacgg gcagtatttg 240  
attgtagcca ttcagcatat tttccaagca attcctgcaa acagtgaaat gtaaagtcaa 300  
tcaggtcaca acaagacatt gttagacaat atttactttc tgcatagaata gtgactatat 360  
ctcagacctc atatatatga ccaacatgtc cccagttagg ccaataactca aagaataaag 420  
catcacactt actttcgcac ttgtgagtg tggagcgagt atttcacctt gaactttgga 480  
tgtagctgct actgaggccg atttttcccc tttgaacacg tacgagatcg caagatcaag 540  
gcttgatagt cgcagggtag ttcctatcag atcaacaact tgtaatctgg cattatcaat 600  
ctgcgataaa agccagagta caaaacacaa aaaagccaag ttagaacaat ccaatttcct 660  
ccttcgtgat tcaacaagat aatatctaata agaatttata ccaacgagag agcctgcctt 720  
ctccaagaaa tgctctcata ttccatctta agcgcgtatt ctttagttcg actgataatc 780  
ttgtctgctg aagccaagtc ttccctagca gctaggcaat cttgtctcac aagagcttcc 840  
acagaagaaa ggagacgctc agcaatcgcc atgggtgtct ccaatttaag ccttattctc 900  
tccatcccg tagctgttga gctatccaag aagctataaa gaaatttctc aagttcattg 960  
aagctctgga ctctccaatt agaaccagga tctgcgatct caagatcatc tctgccaacc 1020  
aaagaagctg ttgaaagctt cgcctcaaga gcagaccgtg cggacaccgg atacaatatc 1080  
acattttctg tattaagcaa cttccgtgta ttctctttaa caaatgaaat agcttcctca 1140  
agctgcagca gtaaaattaa tctttagtca agaaaaatcc agcaattaca gagactatca 1200  
aggaaaagac ataaatattg tttctgataa acctcacgag catcacgata gatatcagat 1260  
ttattcagaa taaacacaaa tttctttttc cactgctgtg tgtaccggag aaacgcaacc 1320  
tgacaaacgc aatgagatgt aaatcagcct acagtaaaat caagacagca ggaagctcca 1380  
gaggtagaga tagaaatgac atgggtatga tgacattgag aagcttattc cttcttttga 1440  
aactttttca gatttttcaa ataagaacca aatattcata aggttagtac ttcgtagatg 1500  
atcatttaca tacaatttgc catggacgta aaatcagttt tgctgtacca ataacaactc 1560

acctctcaaa	tgtattggcc	taagctttac	caaaatatgg	accaacagga	catactgggt	1620
ccagcaatag	ctataacact	cattactttg	aaaataaaatt	agtctagttt	aaattttataa	1680
tcaacaaaaac	cttgatataat	gcattcaacc	tagtgacaac	tttcccttcc	ctacacaagg	1740
tcttgatggg	ctatacatga	cttaactaac	tacttttcgtg	aaaaatagat	ctaacaagct	1800
acttaggcag	atacatattg	agcaaaaaaca	acaacaacta	acatgccaaag	taaaacggta	1860
acttctacct	cacttttcagt	taaagggcgg	tcagcagaaa	gaacaaaaaac	aagcaaattct	1920
gcacgtggaa	caaattcttc	tgtaagacgc	tgttgccttt	gaaggatcac	attgggtccca	1980
gggtgtgtcaa	caatattttat	ctgctcgaaa	ggagaacaac	ccaaatcaat	tcctccaaat	2040
aattagtaaa	aattcaggac	tgcgatggta	gaattttgaa	ttactcacat	ccttaagtat	2100
tggtgcagga	agatagcata	catattggcc	atctggatgt	gtttggcaac	gttggtgtctc	2160
ttcggattcc	aagtcagagt	agcacagaaa	cgtgatttca	ttggtagtgg	ggactacccc	2220
ttctttcagg	tatctcttcc	caagaagtgc	attgataacc	gttgattttc	cagagttaaa	2280
ttccccctag	taccagcaaa	ttgtggattc	caattaatta	tccatacaaa	aactatttttg	2340
aatcataaag	gcaacttgtc	ccacttaaaa	catcttccaa	gaacggcata	ctcacaagtc	2400
acaagaaagc	gaaaaaacta	tgtacacaag	cagatgggtac	agttaagaaa	tatgcagttc	2460
ccttacaacc	agatccataa	gcaaattaag	aagagaagca	tagacagaac	aaaagaagaa	2520
gcgaaacatc	atagtcatag	gcgacgaaaag	aagatattga	gaagcactaa	aggacaagtg	2580
actagaagca	tgcccattgt	atctcaagct	atctagtgtc	ggcaaaaagt	tgtaactaaa	2640
atgtttctgg	aatgaatata	gagctaatac	caatgcaa	tcctggaatc	acaatttgac	2700
ggagttgagt	gcagaattac	cactataacc	atcagaaaacg	gctcatcgat	ccgagaaaca	2760
gcatcaatta	gaaggagac	ttcctccatc	tgtaaatgaa	aaatagtcga	agaagtaaat	2820
gaaaccatat	tataaccaca	caaaaaccta	cttagaacca	tttcaaaaaa	ttgacttcaa	2880
ctaccaaatg	tttgaaataa	aaatcaccag	tggagccgcc	ttgtggatga	tttcaatcgt	2940
ctctctcaac	acagatttct	ccatttctac	tattagtttc	tgtttgcct	ctaattttat	3000
gaagccagca	gaattctttt	tctccggcag	ttcattcata	ttttgtgtct	catgattatt	3060
tacaacataa	gctccatcaa	gactctggcg	aagagctaca	tccttagaag	aacgcaaattc	3120
tttcaacgaa	ataacaaaac	cagaaacacc	tgatttcagt	aactgcaatt	cttcttttagc	3180
ttcttcattg	cctctgcaag	tcacatatat	cggatattttc	acgctcttca	acaaagaatc	3240
cgccacttgc	gtatcttctt	caccagatcc	aagtataagg	aaatcagcac	cctcggagct	3300
tgaggcaatt	agagcagaat	caacatcctt	cacaatccga	gctaccagt	gaagaagtac	3360
cgagtcgggg	ttggatccca	tcaatgtgtt	tctcgccaca	atcgccggaa	gacctgtaca	3420

tagcattgag	agacaaaact	cactctatga	gaaattaaat	gctaaaactg	aatgaaatca	3480
gttgttacct	tcgtcggaga	gagcaacacc	actagcacca	acggcggagg	cgatatcaac	3540
acgttcagcg	atcaagaggt	aagcacggcc	tttgacaagt	gatttcagca	aacaagccgc	3600
ctcgtagagc	ttaccagcgg	tggctccgcc	atcaatcacg	acgatttgaa	ccgatttagc	3660
taaagcacgg	tcgaccaaact	caagagtctc	ttcacgattc	ccgctcataa	cctcgtcggc	3720
gtctagccgg	agaagtaaac	cggaacggc	gagttcggga	cgcttgtaac	caccaggata	3780
aagagttcgc	ggcctagaag	aagaagtctg	atcggcggat	tcatgcgaaa	tgtttctgat	3840
cgagagagaa	gaaaaacgcc	tatgacgtgg	aggagtaaag	gaggataact	taaagcaccg	3900
gccaggaaac	ggtggagatg	cggcggagat	aagaaacggt	gacgtcacac	attgccggtg	3960
agagattaga	gttctcatgg	agagagaaaag	agagagagtg	agataccttc	gtctgtgttt	4020
ctgättāgtt	ttcttatctc	ttaaataatcc	tattggccca	tcccaaagct	ataagacgga	4080
cggcgcgatt	aattactttt	caaacacatg	aattaacggt	ttcacatatg	tgttcatatc	4140
caaaaaggtcc	aaagtatacc	acgaaaaggg	agaaaaacag	atttaaattc	tgaaaatccc	4200
tctcccacaa	ttaaattttac	ttcttccaaa	caaagacaaa	cggcttgaac	cagtcaagta	4260
agtgatacgg	caccactaga	tgttccagag	cctccatctt	ttttaatacg	aagaagattt	4320
gtcctttgtg	tgtatgaatt	taacaagttt	taattataga	tttgtgtgtg	tatgaattta	4380
aaaacctagt	acgtagcatc	agggaatgat	atcatagcta	ttttagttga	gctttcaaact	4440
aagagatgat	caaaatttag	aacttctaag	aacatgaacg	aataaacaac	tattttcttt	4500
tcaaaccaac	taaggtagat	ggtcactgaa	agtatataca	tcagataaaa	gttgcttggt	4560
attccagatg	aagttggacc	gagaaaaaaa	aaagttactt	gttattcaat	atgtttggat	4620
ctttgtcttg	cagattgcta	tatagggttg	ataatgggct	tcgttgtaat	gggtatacag	4680
tgtataagaa	tcggccttgt	gcaaccaatc	ctaatatgtg	tgtctcatta	aggtaagtgc	4740
ttaagattag	aagagtaaaa	cacttgactt	atcaactatg	tcaactaagg	gttctatatt	4800
tttattaaat	aaaaaataat	tgaatatatt	ttagaatgat	ttaataaatt	taatgctatt	4860
gtttgattta	aatgtataat	tcaccgcgag	aagaaatttt	ataactcaaa	ttttaaaagt	4920
ttaagttgta	tttgtttatt	ttgttaaagt	tttaatatgt	tataattgta	ttttgattgt	4980
tgtttctcgg	atttcacccg	tagtacatca	tcccatatta	atatcgaatc	aaacccgtca	5040
attctaaaaat	ttcaccctgt	gtagtattta	attgtataat	tatattttaa	ttgtcattct	5100
aagatttcac	tcctaattct	atcgcaaatt	attatcaacc	caaaccagtc	aattctaaaa	5160
tatcaccctg	agtacaccat	cccatattaa	tatcgaatca	agcccgtcaa	ttctaggatt	5220
tcaccctggg	tagtatttaa	ttgtataatt	atattttaat	tgtcattcta	ggatttcact	5280

```

cctaattcta tcgcaaatta ttatcaaccc aaaccagtca attctaaaat atcacccgta 5340
gtacaccatc ccatattaat atcgattcaa actcgtcaat tctaggattt cgctcgtggg 5400
agtatttaat tgtataatta tattttaatt gtcattttta ctcctagttc tatcgcaa 5460
tcttatcaac ccaaacagtc aattctaaaa tttcacccgt agtataaagt ttaaataatt 5520
ataatattta aatttcctat aaaagaatca aaatgtgttt taaaaaaatt aaagttttta 5580
gttttttttt tttaatattg ttaattttgt ttagtggtta agattatata attacattat 5640
gattgtcatt atatgttttt ctccatagca tactatccca tggtattatc cactcaaacc 5700
tgtcacacca tataaccccg tcccgtagaa ttaaacacaa atttgtcatt ttattataaa 5760
tttcaaatat ttataaaatt agaaacttca aaaaagatta atattgaccc aaacttcac 5820
attgaatttt gagtggtata tctaagattt ctctcgcaat atatcgcccc gtattaatat 5880
cttttatatt gtttaaaatt cttgtaaaat ttaatttata atttttttaa ctttttaaag 5940
tttcaatttt ttaaaataaa taaccctagg aaacaaacca ttttaattta aagataaact 6000
ttataaaaag tttttaaaat tataatatat aacttttgat aaagttataa tatttataat 6060
ttcttgaaac attttaaagt ttcaattctt taaaataata aatccgagta aaatcagata 6120
actattttta ttttggaacg ttgataaatc aagcttcctg ctcatcgtat atcagaatca 6180
ttttggtcct ttataatat gggctcgaac cattgtccaa tttttctaag cgatgtggga 6240
cattgtacac atattatttc ttcatagggt gaataatata tgtccgttta aaaaactttg 6300
aattacatca tattcagaaa aaaatataat attttattaa ctatatatat tttatataaa 6360
ttcaaaataa ataaagtata agatcaaata aaaatgaaag 6400

```

```

<210> 28
<211> 30
<212> PRT
<213> Arabidopsis thaliana

```

```

<400> 28

```

```

Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu
1          5          10          15

```

```

Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His
          20          25          30

```

```

<210> 29
<211> 24
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Synthetic

```

<400> 29	
tgtccaaatt ttatgtgaca ctcc	24
<210> 30	
<211> 23	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 30	
ttgtgaaagg cttgaatgta aga	23
<210> 31	
<211> 20	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 31	
ccgaattctc tgtgttggcg	20
<210> 32	
<211> 24	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 32	
aagcttctgta cagaccctgc tgac	24
<210> 33	
<211> 18	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 33	
ggtaagttga cgggtcaag	18
<210> 34	
<211> 19	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 34	
cgatagggcc gtagctgtc	19

<210> 35  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 35  
ggttaacttg tgatcgaac

19

<210> 36  
<211> 18  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 36  
gcagccagtc tgccctag

18

<210> 37  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 37  
gcgcagtcct ttcttgagg

19

<210> 38  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 38  
ctgaccggtg aggttctgc

19

<210> 39  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 39  
ccaggaatcg ctgaacattc

20

<210> 40



<211>	20	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Synthetic	
<400>	40	
	gcgatcgcgg tagctttcgg	20
<210>	41	
<211>	17	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Synthetic	
<400>	41	
	ctaggcagtg tacgttc	17
<210>	42	
<211>	28	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Synthetic	
<400>	42	
	ccgaattcgt gacctetacc cgtactgc	28
<210>	43	
<211>	28	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Synthetic	
<400>	43	
	ccaagcttcg ttttataaag gcgctcag	28
<210>	44	
<211>	19	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Synthetic	
<400>	44	
	ctgctcgtga gcaatttgc	19
<210>	45	
<211>	16	
<212>	DNA	

<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 45	
ccgttctgaa aggctc	16
<210> 46	
<211> 16	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 46	
cagtgaattg taatac	16
<210> 47	
<211> 18	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 47	
gaaatagcca tgcgagc	18
<210> 48	
<211> 29	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 48	
ccgaattcgt ggcagtggaa aatcgtggg	29
<210> 49	
<211> 27	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 49	
ccgaattcca cttgcacgat tgggatc	27
<210> 50	
<211> 28	
<212> DNA	
<213> Artificial Sequence	

<220>  
 <223> Synthetic  
  
 <400> 50  
 ccgaattcgc cctactcatt aactatag 28  
  
 <210> 51  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic  
  
 <400> 51  
 ccgaattccg gagcgatcgc ttgtttg 27  
  
 <210> 52  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic  
  
 <400> 52  
 gattaatgag actatatatg agag 24  
  
 <210> 53  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic  
  
 <400> 53  
 atctgcataa cttcaattga actg 24  
  
 <210> 54  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic  
  
 <400> 54  
 gaacccccag aatatcaaca tc 22  
  
 <210> 55  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic

<400> 55	
gctctgatgg tgattctggg aac	23
<210> 56	
<211> 26	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 56	
gtagcattct ttagagattg atctag	26
<210> 57	
<211> 28	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 57	
tattcgagtt tgaaattatg atttatgc	28
<210> 58	
<211> 24	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 58	
gctacagttc tcaaccggta aatc	24
<210> 59	
<211> 29	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 59	
cataagcttt tatgctccaa aatagtctc	29
<210> 60	
<211> 24	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Synthetic	
<400> 60	
cttgatcttg tgttctgaca tctc	24

<210> 61  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 61  
ctaaactatt cacaaatgcc atagacg

27

<210> 62  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 62  
agccgtcttg tcccatcatt aaag

24

<210> 63  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 63  
gcacaaacaa acagggtcaa tagtta

26

<210> 64  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 64  
ttaaagtga gcttaagcag agg

23

<210> 65  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 65  
cattgtaga aagtcaaac ttg

24

<210> 66

<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 66  
gcaagacata accaatgaac aag

23

<210> 67  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 67  
gacacgtatg cgtttctaag ag

22

<210> 68  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 68  
ctccaacttc aagcaaaacg gatg

24

<210> 69  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 69  
ctctgttttt tgggctagtg atgg

24

<210> 70  
<211> 22  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 70  
gcatacccaaa tatcctttgt gc

22

<210> 71  
<211> 23  
<212> DNA

<213> Artificial Sequence  
 <220>  
 <223> Synthetic  
 <400> 71  
 gatagtataa ccagaggttg gag 23

<210> 72  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic  
 <400> 72  
 gaatcttctc aaactgaaat ccacc 25

<210> 73  
 <211> 22  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic  
 <400> 73  
 tcgaaaggaa gatcggtgaa cc 22

<210> 74  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic  
 <400> 74  
 gattgtgcta tggttcagga gttc 24

<210> 75  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> Synthetic  
 <400> 75  
 catcagctat aacctcctca gtg 23

<210> 76  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Synthetic  
  
 <400> 76  
 actgactata aggaccctc aaac 24  
  
 <210> 77  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic  
  
 <400> 77  
 gttgaccata attcatccac cactatta 28  
  
 <210> 78  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic  
  
 <400> 78  
 ggaattccga gtcgagttgc tttgttg 27  
  
 <210> 79  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic  
  
 <400> 79  
 cgtctagagc ttacctcaaa ggtacatgga 30  
  
 <210> 80  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic  
  
 <400> 80  
 cgggatccat gagtaaagga gaagaact 28  
  
 <210> 81  
 <211> 27  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Synthetic



<400> 81  
gctctagata gttcatccat gccatgt 27

<210> 82  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 82  
ggactagtag gatggcggaa gtatcagc 28

<210> 83  
<211> 30  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 83  
cgggatccgc accgaaggag ccttttagatt 30

<210> 84  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 84  
gactagttgg ctcaacgctt acctcaa 27

<210> 85  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 85  
cgggatccgc catcgtctct tacga 25

<210> 86  
<211> 61  
<212> PRT  
<213> Arabidopsis thaliana

<400> 86

Asp Pro Tyr Lys Thr Leu Lys Ile Arg Pro Asp Ser Ser Glu Tyr Glu  
1 5 10 15

Val Lys Lys Ala Phe Arg Gln Leu Ala Lys Lys Tyr His Pro Asp Val  
20 25 30

Cys Arg Gly Ser Asn Cys Gly Val Gln Phe Gln Thr Ile Asn Glu Ala  
35 40 45

Tyr Asp Ile Val Leu Lys Gln Ile Lys Asn Gln Met Glu  
50 55 60

<210> 87  
<211> 68  
<212> PRT  
<213> Phaseolus vulgaris

<400> 87

Ser Leu Tyr Asp Ile Leu Gly Ile Pro Ala Gly Ala Ser Ser Gln Glu  
1 5 10 15

Ile Lys Ala Ala Tyr Arg Arg Leu Ala Arg Val Cys His Pro Asp Val  
20 25 30

Ala Ala Ile Asp Arg Lys Asn Ser Ser Ala Asp Glu Phe Met Lys Ile  
35 40 45

His Ala Ala Tyr Ser Thr Leu Ser Asp Pro Asp Lys Arg Ala Asn Tyr  
50 55 60

Asp Arg Ser Leu  
65

<210> 88  
<211> 68  
<212> PRT  
<213> Arabidopsis thaliana

<400> 88

Ser Leu Tyr Glu Ile Leu Glu Ile Pro Val Gly Ser Thr Ser Gln Glu  
1 5 10 15

Ile Lys Ser Ala Tyr Arg Arg Leu Ala Arg Ile Cys His Pro Asp Val  
20 25 30

Ala Arg Asn Ser Arg Asp Asn Ser Ser Ala Asp Asp Phe Met Lys Ile  
35 40 45

His Ala Ala Tyr Cys Thr Leu Ser Asp Pro Glu Lys Arg Ala Val Tyr  
50 55 60

Asp Arg Arg Thr  
65

<210> 89  
<211> 63  
<212> PRT  
<213> *Mycoplasma pneumoniae*

<400> 89

Thr Leu Tyr Asp Leu Leu Glu Leu Pro Gln Thr Ala Thr Leu Gln Glu  
1 5 10 15

Ile Lys Thr Ala Tyr Lys Arg Leu Ala Lys Arg Tyr His Pro Asp Ile  
20 25 30

Asn Lys Gln Gly Ala Asp Thr Phe Val Lys Ile Asn Asn Ala Tyr Ala  
35 40 45

Val Leu Ser Asp Thr Thr Gln Lys Ala Glu Tyr Asp Ala Met Leu  
50 55 60

<210> 90  
<211> 63  
<212> PRT  
<213> *Mycoplasma genitalium*

<400> 90

Asn Leu Tyr Asp Leu Leu Glu Leu Pro Thr Thr Ala Ser Ile Lys Glu  
1 5 10 15

Ile Lys Ile Ala Tyr Lys Arg Leu Ala Lys Arg Tyr His Pro Asp Val  
20 25 30

Asn Lys Leu Gly Ser Gln Thr Phe Val Glu Ile Asn Asn Ala Tyr Ser  
35 40 45

Ile Leu Ser Asp Pro Asn Gln Lys Glu Lys Tyr Asp Ser Met Leu  
50 55 60

<210> 91  
<211> 68  
<212> PRT  
<213> *Arabidopsis thaliana*

<400> 91

Ser Phe Tyr Asp Leu Leu Gly Val Thr Glu Ser Val Thr Leu Pro Glu  
1 5 10 15

Ile Lys Gln Ala Tyr Lys Gln Leu Ala Arg Lys Tyr His Pro Asp Val



50

55

60

Asn Tyr Asp Tyr Tyr Leu  
65 70

<210> 94  
<211> 72  
<212> PRT  
<213> Arabidopsis thaliana  
<400> 94

Ser Pro Tyr Asp Thr Leu Glu Leu Asp Arg Asn Ala Glu Glu Glu Gln  
1 5 10 15

Ile Lys Val Ala Tyr Arg Arg Leu Ala Lys Phe Tyr His Pro Asp Val  
20 25 30

Tyr Asp Gly Lys Gly Thr Leu Glu Glu Gly Glu Thr Ala Glu Ala Arg  
35 40 45

Phe Ile Lys Ile Gln Ala Ala Tyr Glu Leu Leu Met Asp Ser Glu Lys  
50 55 60

Lys Val Gln Tyr Asp Met Asp Asn  
65 70

<210> 95  
<211> 68  
<212> PRT  
<213> Schizosaccharomyces pombe

<400> 95

Lys Leu Tyr Asp Ile Leu Glu Val His Phe Glu Ala Ser Ala Glu Glu  
1 5 10 15

Ile Lys Lys Ser Tyr Lys Arg Leu Ala Leu Leu His His Pro Asp Lys  
20 25 30

Ala Pro Ile His Glu Lys Glu Glu Ala Ala Glu Arg Phe Arg Gly Val  
35 40 45

Gln Glu Ala Tyr Asp Ile Leu Lys Asp Pro Glu Ser Arg Glu Met Tyr  
50 55 60

Asp Met Tyr Gly  
65

<210> 96

<211> 66  
<212> PRT  
<213> Unknown

<220>  
<223> Synthetic

<400> 96

Asp Phe Tyr Lys Ile Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly  
1 5 10 15

Ile Arg Arg Ala Phe Glu Ser Arg Ile Ala Lys Pro Pro Gln Tyr Gly  
20 25 30

Tyr Ser Thr Glu Ala Leu Ala Gly Arg Arg Gln Met Leu Gln Ile Ala  
35 40 45

His Asp Thr Leu Thr Asn Gln Ser Ser Arg Thr Glu Tyr Asp Arg Ala  
50 55 60

Leu Ser  
65

<210> 97  
<211> 66  
<212> PRT  
<213> Oryza sativa

<400> 97

Asp Phe Tyr Lys Val Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly  
1 5 10 15

Ile Arg Arg Ala Phe Glu Ala Arg Ile Ala Lys Pro Pro Gln Tyr Gly  
20 25 30

Tyr Ser Thr Asp Ala Leu Val Gly Arg Arg Gln Met Leu Gln Ile Ala  
35 40 45

His Asp Thr Leu Met Asn Gln Asn Ser Arg Thr Gln Tyr Asp Arg Ala  
50 55 60

Leu Ser  
65

<210> 98  
<211> 66  
<212> PRT  
<213> Solanum tuberosum

<400> 98

Asp Phe Tyr Arg Val Leu Gly Ala Glu Ala His Phe Leu Gly Asp Gly  
1 5 10 15

Ile Arg Arg Cys Tyr Asp Ala Arg Ile Thr Lys Pro Pro Gln Tyr Gly  
20 25 30

Tyr Ser Gln Glu Ala Leu Ile Gly Arg Arg Gln Ile Leu Gln Ala Ala  
35 40 45

Cys Glu Thr Leu Ala Asp Ser Thr Ser Arg Arg Glu Tyr Asn Gln Gly  
50 55 60

Leu Ala  
65

<210> 99  
<211> 66  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Synthetic

<400> 99

Asp Leu Tyr Lys Ile Leu Gly Ala Glu Thr His Phe Leu Gly Asp Gly  
1 5 10 15

Ile Arg Arg Ala Tyr Glu Ala Lys Phe Ser Lys Pro Pro Gln Tyr Ala  
20 25 30

Phe Ser Asn Glu Ala Leu Ile Ser Arg Arg Gln Ile Leu Gln Ala Ala  
35 40 45

Cys Glu Thr Leu Ala Asp Pro Ala Ser Arg Arg Glu Tyr Asn Gln Ser  
50 55 60

Leu Val  
65

<210> 100  
<211> 66  
<212> PRT  
<213> Arabidopsis thaliana

<400> 100

Asp Phe Tyr Gln Val Leu Gly Ala Gln Thr His Phe Leu Thr Asp Gly  
1 5 10 15

Ile Arg Arg Ala Phe Glu Ala Arg Val Ser Lys Pro Pro Gln Phe Gly





50

55

60

Leu Leu  
65

<210> 103  
<211> 66  
<212> PRT  
<213> Synechocystis PCC6803  
  
<400> 103

Asp His Phe Arg Leu Leu Gly Val Ser Pro Ser Ala Asp Pro Ala Ser  
1 5 10 15

Ile Leu Arg Arg Leu Gln Thr Arg Ser Asp Ser Pro Pro Asp Asp Gly  
20 25 30

Phe Thr His Glu Gly Leu Leu Gln Arg Gln Ala Leu Leu His Arg Ser  
35 40 45

Ala Asp Leu Leu Thr Asp Pro Ser Glu Arg Ala Asp Tyr Glu Ala Ala  
50 55 60

Leu Leu  
65

<210> 104  
<211> 66  
<212> PRT  
<213> Synechocystis PCC6803  
  
<400> 104

Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln Ser Gly Gly Glu Thr  
1 5 10 15

Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln Leu Pro Arg Arg Glu  
20 25 30

Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln Leu Leu Ala Ile Ala  
35 40 45

Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln Ala Tyr Asp Gln Glu  
50 55 60

Trp Trp  
65

<210> 105

<211> 66  
<212> PRT  
<213> Nostoc punctiforme

<400> 105

Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Glu Glu Gln  
1 5 10 15

Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu  
20 25 30

Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln Leu Ile Glu Glu Ala  
35 40 45

Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser Thr Tyr Asp Gln Leu  
50 55 60

Tyr Leu  
65

<210> 106  
<211> 66  
<212> PRT  
<213> Anabaena PCC7120

<400> 106

Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln  
1 5 10 15

Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu  
20 25 30

Tyr Ser Gln Ala Ala Ile Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala  
35 40 45

Tyr Val Val Leu Ser Asp Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu  
50 55 60

Tyr Leu  
65

<210> 107  
<211> 66  
<212> PRT  
<213> Bombyx mori

<400> 107

Asp Tyr Tyr Ala Leu Leu Gly Cys Asp Glu Asn Ser Thr Val Glu Gln  
1 5 10 15

Ile Thr Ala Glu Tyr Lys Ile Leu Ala Leu Gln His His Pro Asp Lys  
20 25 30

Asn Asp Gly Glu Lys Glu Ala Glu Met Lys Phe Gln Lys Leu Lys Glu  
35 40 45

Ala Lys Glu Ile Leu Cys Asp Pro Ser Lys Arg Ala Leu Tyr Asp Lys  
50 55 60

Trp Arg  
65

<210> 108

<211> 66

<212> PRT

<213> Drosophila melanogaster

<400> 108

Asp Phe Tyr Gly Leu Leu His Cys Asp Glu Asn Ser Ser Pro Glu Gln  
1 5 10 15

Ile Gln Ala Glu Tyr Lys Val Leu Ala Leu Gln Tyr His Pro Asp Lys  
20 25 30

Asn Ser Gly Asp Lys Glu Ala Glu Ala Lys Phe Gln Gln Leu Lys Glu  
35 40 45

Ala Lys Glu Thr Leu Cys Asp Pro Glu Lys Arg Ala Ile Tyr Asp Lys  
50 55 60

Trp Arg  
65

<210> 109

<211> 66

<212> PRT

<213> Mus musculus

<400> 109

Asp Tyr Tyr Ala Leu Leu Gly Cys Asp Glu Leu Ser Ser Val Glu Gln  
1 5 10 15

Ile Leu Ala Glu Phe Lys Ile Arg Ala Leu Glu Cys His Pro Asp Lys  
20 25 30

His Pro Glu Asn Ser Lys Ala Val Glu Thr Phe Gln Lys Leu Gln Lys  
35 40 45

Ala Lys Glu Ile Leu Cys Asn Ala Glu Ser Arg Ala Arg Tyr Asp His  
 50 55 60

Trp Arg  
 65

<210> 110  
 <211> 65  
 <212> PRT  
 <213> *Saccharomyces cerevisiae*

<400> 110

Asp Ala Tyr Ser Ile Leu Gly Val Pro Pro Asp Ser Ser Gln Glu Gln  
 1 5 10 15

Ile Arg Lys His Tyr Lys Lys Ile Ala Val Leu Val His Pro Asp Lys  
 20 25 30

Asn Lys Gln Ala Gly Ala Glu Glu Ala Phe Lys Val Leu Gln Arg Ala  
 35 40 45

Phe Glu Leu Ile Gly Glu Pro Glu Asn Arg Leu Ile Tyr Asp Gln Ser  
 50 55 60

Ile  
 65

<210> 111  
 <211> 64  
 <212> PRT  
 <213> *Leishmania major*

<400> 111

Glu Leu Tyr Gln Val Leu Glu Leu Asp Ala Gln Cys Thr Thr Ala Glu  
 1 5 10 15

Ile Ser Gln Gln Tyr Arg Arg Leu Ala Leu Arg Tyr His Pro Asp Arg  
 20 25 30

Asn Ala Gly Ala Thr Val Glu Gln Phe Gln Arg Ile Glu Glu Ala His  
 35 40 45

Arg Val Leu Ser Asp Leu Arg Gln Arg Gln Leu Tyr Asp Thr Val Gly  
 50 55 60

<210> 112  
 <211> 67  
 <212> PRT  
 <213> *Schizosaccharomyces pombe*

<400> 112

Asp Tyr Tyr Thr Ile Leu Gly Ala Glu Ser Thr Ser Ser Tyr Val Glu  
1 5 10 15

Ile Arg Gln Gln Tyr Leu Lys Leu Val Leu Arg Tyr His Pro Asp Arg  
20 25 30

Asn Pro Gly Arg Glu Ala Glu Val Leu Pro Gln Phe Gln Leu Ile Gln  
35 40 45

Lys Ala His Glu Val Leu Lys Asp Pro Lys Leu Arg Glu Leu Phe Asp  
50 55 60

Gln Arg Arg  
65

<210> 113

<211> 67

<212> PRT

<213> Schizosaccharomyces pombe

<400> 113

Asp Tyr Tyr Ala Ile Leu Lys Leu Gln Lys Asn Ala Thr Phe Gln Gln  
1 5 10 15

Ile Arg Lys Gln Tyr Leu Phe Leu Ala Leu Gln Tyr His Pro Asp Arg  
20 25 30

Asn Pro Gly Asp Glu Glu Arg Ala Val Lys Arg Phe Gln Arg Leu Gln  
35 40 45

Leu Ala His Glu Val Leu Ser Asp Ala Thr Lys Arg Leu Ile Tyr Asp  
50 55 60

Gln Leu Phe  
65

<210> 114

<211> 68

<212> PRT

<213> Schizosaccharomyces pombe

<400> 114

Asn His Tyr Ser Val Leu Asn Leu Lys Asp Gly Lys Thr Tyr Thr Asp  
1 5 10 15

Asp Glu Ile Lys Glu Ala Tyr Arg Lys Ala Leu Leu Leu Phe His Pro  
20 25 30

Asp Lys Cys Lys Glu Lys Pro Ser Val Val Tyr Thr Ile Asp Gln Val  
 35 40 45

Lys Glu Ala Tyr Gln Val Leu Ser Ser Glu Lys Asp Arg Gln Gln Tyr  
 50 55 60

Gln Ile Lys Gln  
 65

<210> 115  
 <211> 652  
 <212> PRT  
 <213> Anabaena PCC7120

<400> 115

Gln Gly Lys Tyr Ala Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu  
 1 5 10 15

Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln Leu Arg Gln Ala Tyr Ser  
 20 25 30

Asp Arg Ile Val Gln Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile  
 35 40 45

Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp  
 50 55 60

Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr  
 65 70 75 80

Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala Val Glu Asn Arg Gly  
 85 90 95

Asp Ser Asn Asn Gly His Phe Asp Val Gln Ser Leu Ser Ile Glu Val  
 100 105 110

Ser Ser Glu Glu Leu Ile Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly  
 115 120 125

Glu Tyr Glu Leu Val Leu Lys Leu Gly Arg Asn Tyr Leu Gly Asn Gln  
 130 135 140

Asn Gly Thr Ala Ser Thr Arg Asn Gly Asn His Arg Thr Pro Glu Glu  
 145 150 155 160

Phe Leu Asp Ser Ser Glu Arg Pro Asp Ile Leu Leu Thr Val Ala Leu  
 165 170 175

Ala Ser Leu Glu Leu Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu  
180 185 190

Asn Ala Ala Leu Ser Leu Glu Thr Gly Gln Glu Val Leu Phe Ser Glu  
195 200 205

Gly Ile Phe Pro Ser Val Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys  
210 215 220

Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys  
225 230 235 240

Thr Ile Glu Arg His Gln Gly Leu Asp Leu Leu Gln Ser Ile Leu Asp  
245 250 255

Asp Arg Gly Gly Ile Asp Gly Thr Gly Asn Asp Gln Ser Gly Leu Asn  
260 265 270

Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln Leu Arg His His Leu Thr  
275 280 285

Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu Ser Lys Arg Pro Ser  
290 295 300

Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser Ile Ala Arg Gly Phe  
305 310 315 320

Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala Lys Gln Ile Leu Met  
325 330 335

Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala  
340 345 350

Leu Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser  
355 360 365

Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu Lys Ser Gln Asp Ser  
370 375 380

Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln  
385 390 395 400

Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser Arg Gln Gln Ala Ser  
405 410 415

Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala





<213> Nostoc punctiforme

<400> 116

Met Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala  
1 5 10 15

Ala Ser Glu Glu Gln Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln  
20 25 30

Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln  
35 40 45

Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser  
50 55 60

Thr Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr Asp Pro Asp Asn Leu  
65 70 75 80

Ala Ala Ala Ala Val Ala Gln Glu Asn Arg Thr Glu Ser Thr Lys Arg  
85 90 95

Gly Ser Asp Thr Gln Ser Leu Gly Ile Glu Ile Thr Gln Asp Glu Leu  
100 105 110

Val Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val  
115 120 125

Leu Lys Leu Gly Arg Pro Tyr Leu Val Asn Lys Asn Ser Ala Thr Ser  
130 135 140

Ser Arg Lys Ser Asn Asn Leu Ala Asp Glu Glu Ile Tyr Glu Ser Ala  
145 150 155 160

Glu His Pro Asp Val Val Leu Thr Val Ala Leu Ala Cys Leu Glu Leu  
165 170 175

Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu Asn Ala Ala Ile Ser  
180 185 190

Leu Glu Thr Gly Gln Glu Leu Leu Val Arg Glu Gly Leu Phe Ser Ser  
195 200 205

Ile Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg  
210 215 220

Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys Thr Ala Glu Arg Ser  
225 230 235 240

Gln Gly Leu Glu Leu Leu Gln Asn Leu Leu Glu Asp Arg Gly Gly Ile  
 245 250 255  
 Asp Gly Thr Asn Asn Asp Glu Ser Gly Leu Asn Ile Asp Asp Phe Leu  
 260 265 270  
 Arg Phe Ile Gln Gln Leu Arg Asn His Leu Thr Val Ala Glu Gln His  
 275 280 285  
 Lys Leu Phe Glu Ala Gln Ser Lys Arg Ser Ser Ala Val Ala Thr Tyr  
 290 295 300  
 Leu Ala Val Tyr Ala Leu Ile Ala Arg Gly Phe Ala Gln Arg Gln Pro  
 305 310 315 320  
 Ala Leu Ile Arg Gln Ala Arg Gln Met Leu Val Arg Leu Gly Lys Arg  
 325 330 335  
 Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln  
 340 345 350  
 Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala  
 355 360 365  
 Leu Ala Phe Ile Arg Glu Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro  
 370 375 380  
 Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln His Glu Val Phe Pro  
 385 390 395 400  
 His Phe Arg Asp Leu Ala Asn Gln Gln Ala Phe Leu Lys Asp Tyr Phe  
 405 410 415  
 Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala Leu Pro Thr Asp Ala  
 420 425 430  
 Gln Thr Thr Asn Glu Trp Ala Val Ile Asn Pro Gln Tyr Phe Pro Gln  
 435 440 445  
 Ala Lys Ala Lys Asn Thr His Phe His Asn Asn Ser Thr Lys Thr Ser  
 450 455 460  
 Ala Ser Phe Asn His Ser Arg Val Pro Asn Pro Asp Leu Pro Glu Thr  
 465 470 475 480  
 Pro Thr Lys Glu Thr Ser Glu Tyr Pro Asn Phe Ser Pro Pro Met Trp



Ser Asn Arg Glu Val Ala Gly Leu Ile Leu Leu Trp Glu Ser Gly Ser  
85 90 95

Ser Lys Glu Ala Phe Lys Ile Thr Arg Lys Ala Leu Gln Pro Pro Gln  
100 105 110

Thr Pro Ala Leu Gly Ser Ser Arg Glu Ala Asp Leu Thr Leu Leu Ala  
115 120 125

Ala Leu Thr Ser Arg Asp Ala Ala Ile Gln Glu Gln Asp Gln Arg Ser  
130 135 140

Tyr Ser Asn Ala Ala Asp Phe Leu Gln Glu Gly Ile Gln Leu Leu Gln  
145 150 155 160

Arg Met Gly Lys Leu Gly Glu Leu Arg Lys Thr Leu Glu Glu Asp Leu  
165 170 175

Val Ser Leu Leu Pro Tyr Arg Ile Leu Asp Leu Leu Ser Arg Asp Leu  
180 185 190

Asn Asp Tyr Asp Ser His Lys Lys Gly Leu Ser Met Leu Glu Asn Leu  
195 200 205

Ile Ile Lys Arg Gly Gly Leu Glu Gly Lys Asn Lys Ser Glu Tyr Asn  
210 215 220

Asp Phe Leu Asn Gln Gln Glu Phe Glu Ser Phe Phe Gln Gln Ile Lys  
225 230 235 240

Pro Phe Leu Thr Val Gln Asp Gln Ile Asp Leu Phe Leu Glu Leu Gln  
245 250 255

Lys Arg Gly Ser Ser Glu Ala Gly Phe Leu Ala Phe Leu Ser Leu Thr  
260 265 270

Ala Ile Gly Phe Ala Arg Arg Lys Pro Ala Lys Leu Phe Glu Ala Arg  
275 280 285

Lys Ile Leu Lys Lys Leu Asn Leu Ser Gly Leu Asp Ser Met Pro Leu  
290 295 300

Ile Gly Cys Leu Asp Leu Leu Leu Ala Asp Val Glu Gln Ser Ser Ala  
305 310 315 320

Arg Phe Leu Ser Ser Ser Asp Glu Lys Leu Arg Asp Trp Leu Asn Asn  
325 330 335

Tyr Pro Gly Glu Lys Leu Glu Ala Ile Cys Ile Phe Cys Lys Asn Trp  
340 345 350

Leu Glu Asn Asp Val Leu Val Gly Tyr Arg Asp Ile Asp Leu Lys Glu  
355 360 365

Ile Asp Leu Asp Ser Trp Phe Glu Asp Arg Glu Ile Gln Glu Phe Ile  
370 375 380

Glu Gln Ile Glu Lys Lys Ser Asn Arg Thr Val Phe Lys Ser Gly Pro  
385 390 395 400

Gln Asn Lys Pro Ile Phe Gln Ala Gln Glu Ser Leu Lys Asp Ser Ser  
405 410 415

Thr Gly Pro Asp Leu Asn Ser Asp Asn Phe Glu Glu Gly Arg Leu Pro  
420 425 430

Leu Pro Gly Gly Val Arg Glu Asp Gly Gln Glu Val Ile Glu Glu Asn  
435 440 445

Ile Tyr Thr Asp Glu Ile Ile Lys Asn Lys Ser Ile Glu Phe Tyr Lys  
450 455 460

Tyr Ala Ile Glu Lys Ile Ala Glu Leu Lys Phe Val Phe Gly Glu Ala  
465 470 475 480

Leu Glu Asn Tyr Arg Ile Phe Asn Lys Ser Ser Tyr Leu Thr Tyr Leu  
485 490 495

Tyr Ala Phe Leu Ile Leu Phe Ala Phe Gly Leu Gly Val Gly Phe Val  
500 505 510

Arg Asn Asn Leu Lys Lys Pro Val Gln Glu Lys Glu Ile Ile Asp Asn  
515 520 525

Ser Leu Ser Ile Asn Glu Asn Lys Asn Val Phe Tyr Glu Gly Leu Asn  
530 535 540

Gln Asp Asp Lys Lys Lys Val Leu Asp Asn Ser Lys Ile  
545 550 555

<210> 118  
<211> 524  
<212> PRT  
<213> Protochlorococcus marinus MT9313

<400> 118

Met Ala Ala Gln Leu Val Asp Leu Pro Ile Asp His Phe Arg Leu Leu  
1 5 10 15

Gly Val Ser Pro Ser Ala Asp Ser Glu Ala Ile Leu Arg Ala Leu Glu  
20 25 30

Leu Arg Leu Asp Arg Cys Pro Asp Gln Gly Phe Thr His Glu Val Leu  
35 40 45

Ile Gln Arg Ala Glu Leu Leu Arg Leu Ser Ala Asp Leu Leu Thr Asp  
50 55 60

Pro Pro Arg Arg Gln Ala Tyr Glu Thr Ala Leu Leu Glu Leu Ser Arg  
65 70 75 80

Asp His Pro Gly Glu Thr Ala Gly Leu Asp Val Ser Pro Ser Arg Glu  
85 90 95

Val Ala Gly Leu Ile Leu Leu Phe Glu Ala Asn Ser Ser His Glu Val  
100 105 110

Phe His Leu Ala Ser Gln Gly Leu Gln Pro Pro Gln Ser Pro Thr Leu  
115 120 125

Gly Ser Glu Arg Glu Ala Asp Leu Ala Leu Leu Ala Leu Ala Cys  
130 135 140

Arg Ala Ala Ala Ala Glu Glu Gln Glu Gln Arg Arg Tyr Glu Ala Ala  
145 150 155 160

Ala Ser Leu Leu His Asp Gly Ile Gln Leu Leu Gln Arg Met Gly Lys  
165 170 175

Leu Ser Glu Glu Cys His Lys Leu Glu Asn Asp Leu Asp Ala Leu Leu  
180 185 190

Pro Tyr Arg Ile Leu Asp Leu Leu Ser Arg Asp Leu Gly Asp Gln Val  
195 200 205

Ser His Gln Glu Gly Leu Arg Leu Leu Asp Asn Phe Val Ser Gln Arg  
210 215 220

Gly Gly Leu Glu Gly Thr Ala Pro Ser Pro Ala Pro Gly Gly Leu Asp  
225 230 235 240



Gln Arg Pro Arg Thr Ser Val Ser Thr Ala Ala Asp Gln Pro Gln Val  
500 505 510

Thr Ala Pro Pro Thr Ala Thr Leu Gln Glu Glu Val  
515 520

<210> 119  
<211> 566  
<212> PRT  
<213> Synechocystis PCC6803

<400> 119

Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln  
1 5 10 15

Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln  
20 25 30

Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln  
35 40 45

Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln  
50 55 60

Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu  
65 70 75 80

Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu  
85 90 95

Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val  
100 105 110

Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly  
115 120 125

Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu  
130 135 140

Leu Ser Arg Glu Arg Trp Gln Gln Gln Gln Tyr Glu Phe Ala Ala Thr  
145 150 155 160

Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro  
165 170 175

Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr  
180 185 190



Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg  
195 200 205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly  
210 215 220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe  
225 230 235 240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln  
245 250 255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser  
260 265 270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp  
275 280 285

Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn  
290 295 300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Leu Gly  
305 310 315 320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile  
325 330 335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr  
340 345 350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Glu Ile Val Pro  
355 360 365

Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe  
370 375 380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser  
385 390 395 400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala  
405 410 415

Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp  
420 425 430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg

435	440	445
Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu 450 455 460		
Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu 465 470 475 480		
Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser 485 490 495		
Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg 500 505 510		
Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu 515 520 525		
Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg 530 535 540		
Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe 545 550 555 560		
Leu Asp Gln Pro Ser Glu 565		
<210> 120		
<211> 573		
<212> PRT		
<213> Synechococcus PCC7002		
<400> 120		
Thr Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Cys Val Pro Ala 1 5 10 15		
Lys Ala Thr Thr Ala Gln Ile Thr Gln Ala Tyr Arg Asp Arg Leu Ser 20 25 30		
Gln Phe Pro Arg Arg Glu His Asn Ala Leu Ala Ile Glu Ala Arg Asn 35 40 45		
Arg Ile Ile Glu Gln Ala Phe Glu Val Leu Ser Gln Thr Glu Thr Arg 50 55 60		
Ala Val Tyr Asp His Glu Leu Ser Gly Asn Met Phe Arg Ser Leu Val 65 70 75 80		

Pro Ser Arg Pro Lys Leu Pro Phe Pro Asp Arg Pro Ser Ser Asp Thr  
 85 90 95  
 Glu Leu Glu Ala Leu Thr Ala His Gln Pro Thr Ile Asp Ile Ala Glu  
 100 105 110  
 Lys Asp Leu Leu Gly Gly Leu Leu Leu Leu Asp Leu Gly Glu Tyr  
 115 120 125  
 Glu Leu Val Leu Lys Trp Ala Ala Pro Tyr Leu Lys Gly Lys Gly Lys  
 130 135 140  
 Leu Val Lys Glu Gly Lys Phe Gly Ala Val Glu Ile Val Glu Gln Glu  
 145 150 155 160  
 Leu Arg Leu Cys Leu Ala Leu Ala His Trp Glu Leu Ser Arg Glu Gln  
 165 170 175  
 Trp Leu Gln Gln His Tyr Glu Gln Ala Ala Leu Ser Gly Gln Lys Ser  
 180 185 190  
 Gln Glu Leu Leu Val Asp Val Ala Gln Phe Ala Asp Leu Gln Gln Glu  
 195 200 205  
 Ile Gln Gly Asp Leu Asn Arg Leu Arg Pro Tyr Gln Val Leu Glu Leu  
 210 215 220  
 Leu Ala Leu Pro Glu Ser Glu Thr Gln Glu Arg Gln Arg Gly Leu Gln  
 225 230 235 240  
 Leu Leu Gln Glu Met Leu Ser Ala Arg Val Gly Ile Asp Gly Gln Gly  
 245 250 255  
 Asp Asp Gln Ser Gly Leu Ser Ile Asp Asp Phe Leu Arg Phe Ile Gln  
 260 265 270  
 Gln Leu Arg Ser Tyr Leu Thr Val Gln Glu Gln Leu Asp Leu Phe Val  
 275 280 285  
 Ala Glu Ser Lys Arg Pro Ser Ala Ala Ala Ala Tyr Leu Ala Val Tyr  
 290 295 300  
 Ala Leu Leu Ala Ala Gly Phe Ser Gln Arg Lys Pro Asp Leu Val Val  
 305 310 315 320  
 Gln Ala Gln Thr Leu Leu Lys Arg Leu Gly Lys Arg Gln Asp Val Phe  
 325 330 335

Leu Glu Gln Ser Ile Cys Ala Leu Leu Leu Gly Gln Pro Ser Glu Ala  
 340 345 350

Asn Gln Leu Leu Glu Gln Ser Gln Glu Gln Glu Ala Ile Ala Tyr Ile  
 355 360 365

Gln Glu Gln Ser Glu Gly Ala Pro Asp Leu Leu Pro Gly Leu Cys Leu  
 370 375 380

Tyr Gly Glu Gln Trp Leu Lys Thr Glu Val Phe Ser His Phe Arg Asp  
 385 390 395 400

Leu Arg Gln Arg Leu Glu Asp Gly Ser Val Ser Leu Thr Ala Tyr Phe  
 405 410 415

Ala Asp Pro Glu Val Gln Gln Tyr Leu Asp Asp Leu Leu Thr Glu Ala  
 420 425 430

Val Pro Thr Pro Thr Pro His Pro Asp Thr Glu Ser Thr Ala Ala Pro  
 435 440 445

Ser Glu Lys Pro Pro Glu Thr Leu Gln Ser Glu Thr Gly Val Ser Pro  
 450 455 460

His Pro Ser Arg Pro Ala Lys Val Asp Ser Phe Glu Asp Leu Val Thr  
 465 470 475 480

Gln Thr Pro Ala Thr Val Pro Pro Ala Pro Pro Ser Pro Gly Val Ala  
 485 490 495

Pro Val Thr Ala Ala Leu Asn Pro Asp Pro Glu Ala Ser Ser Ala Ser  
 500 505 510

Ser Lys Ser Val Ser Ser Lys Lys Ser Ile Gly Pro Trp Gly Ala Ile  
 515 520 525

Ala Ala Ile Val Gly Ser Val Leu Leu Val Val Gly Leu Val Arg Ile  
 530 535 540

Leu Ser Gly Leu Thr Thr Gln Glu Pro Leu Gln Val Thr Leu Asn Gly  
 545 550 555 560

Glu Pro Pro Leu Thr Ile Pro Ser Leu Asp Thr Ala Glu  
 565 570

<210> 121

<211> 515  
 <212> PRT  
 <213> Synechococcus WH8102

<400> 121

Gly Asp Leu Trp Thr Leu Asp Leu Pro Ile Asp His Phe Arg Leu Leu  
 1 5 10 15

Gly Val Ser Pro Ser Ala Asp Pro Ala Ser Ile Leu Arg Arg Leu Gln  
 20 25 30

Thr Arg Ser Asp Ser Pro Pro Asp Asp Gly Phe Thr His Glu Gly Leu  
 35 40 45

Leu Gln Arg Gln Ala Leu Leu His Arg Ser Ala Asp Leu Leu Thr Asp  
 50 55 60

Pro Ser Glu Arg Ala Asp Tyr Glu Ala Ala Leu Leu Ser Leu Ser Ala  
 65 70 75 80

Thr His Pro Asn Glu Thr Val Gly Leu Asp Leu Ala Ala Ser Ser Glu  
 85 90 95

Val Ala Gly Leu Ile Leu Leu Trp Glu Ala Gly Ala Ala Leu Glu Ala  
 100 105 110

Phe Gln Leu Ala Arg Gln Gly Leu Gln Pro Pro Gln Ala Pro Ala Leu  
 115 120 125

Gly Ser Gly Arg Glu Ala Asp Leu Thr Leu Leu Ala Ala Leu Ala Cys  
 130 135 140

Arg Asp Ala Ala Arg Asp Glu Gln Gln Gln Arg Arg Tyr Glu Ser Ala  
 145 150 155 160

Ala Gln Leu Leu Arg Asp Gly Ile Glu Leu Gln Gln Arg Met Gly Lys  
 165 170 175

Leu Pro Asp Gln Gln Ala Arg Leu Gln Gln Glu Leu Asp Asp Leu Leu  
 180 185 190

Pro Tyr Arg Val Leu Asp Leu Leu Ser Arg Asp Leu Ser Asp Ala Asp  
 195 200 205

Ala Arg Gln Gln Gly Ile Ser Leu Leu Asp Gln Leu Val Arg Asp Arg  
 210 215 220

Gly Gly Leu Asp Pro Glu Gly Leu Asp Ser Glu Thr Pro Ala Ala Met  
 225 230 235 240

Gly Gln Ala Asp Phe Glu Ser Phe Phe Gln Gln Ile Arg Arg Phe Leu  
 245 250 255

Thr Val Gln Glu Gln Val Asp Leu Phe Arg Gly Trp Phe Ala Glu Gly  
 260 265 270

Ser Ile Glu Ala Gly Cys Leu Ala Val Phe Ala Leu Ala Ala Ala Gly  
 275 280 285

Tyr Ser Arg Arg Lys Pro Glu Phe Leu Glu Gln Ala Arg Glu Gln Leu  
 290 295 300

Gln Arg Leu Val Ala Ser Asp Leu Asp Pro Met Pro Leu Leu Gly Cys  
 305 310 315 320

Leu Asp Leu Leu Leu Gly Asn Val Ala Glu Ala Ser Leu His Phe Ser  
 325 330 335

Ala Ile Arg Asp Glu Glu Leu Leu Ser Trp Leu Ala Glu His Pro Gly  
 340 345 350

Asp His Leu Ala Ala Gln Cys Glu Tyr Cys Arg Val Trp Leu Glu Arg  
 355 360 365

Asp Val Leu Pro Gly Tyr Arg Asp Val Asp Ala Ala Gly Val Asp Leu  
 370 375 380

Asp Ala Trp Phe Ala Asp Arg Asp Val Gln Ala Tyr Val Asp Arg Ile  
 385 390 395 400

Asp Arg Gln Ser Ala Arg Leu Gly Ser Ala Ala Thr Val Thr Gly Ala  
 405 410 415

Gly Leu Ser Ser Ala Pro Ser Ala Asp Ala Ser Ser Pro His Glu Ala  
 420 425 430

Ala Leu Asp Asp Asp His Leu Pro Ala Glu Glu Ala Pro Ser Ser Asp  
 435 440 445

Pro Ala Asn Gln Arg Leu Ser Asn Arg Leu Arg Trp Leu Ala Ala Ser  
 450 455 460

Leu Val Val Gly Leu Val Ala Ala Leu Ala Ala Ala Val Met Leu Arg  
 465 470 475 480

Pro Arg Glu Thr Ala Pro Val Val Leu Gln Pro Glu Pro Asp Arg Gln  
485 490 495

Asp Ala Val Glu Pro Lys Pro Ser Ala Gln Asp Ser Ala Thr Leu Lys  
500 505 510

Pro Gln Ala  
515

<210> 122  
<211> 525  
<212> PRT  
<213> Oryza sativa

<400> 122

Ala-Ala Glu Arg Ser Leu-Pro Leu Gln Val Asp Phe Tyr Lys Val Leu--  
1 5 10 15

Gly Ala Glu Pro His Phe Leu Gly Asp Gly Ile Arg Arg Ala Phe Glu  
20 25 30

Ala Arg Ile Ala Lys Pro Pro Gln Tyr Gly Tyr Ser Thr Asp Ala Leu  
35 40 45

Val Gly Arg Arg Gln Met Leu Gln Ile Ala His Asp Thr Leu Met Asn  
50 55 60

Gln Asn Ser Arg Thr Gln Tyr Asp Arg Ala Leu Ser Glu Asn Arg Glu  
65 70 75 80

Glu Ala Leu Thr Met Asp Ile Ala Trp Asp Lys Glu Ala Gly Glu Ala  
85 90 95

Leu Ala Val Leu Val Thr Gly Glu Gln Leu Leu Leu Asp Arg Pro Pro  
100 105 110

Lys Arg Phe Lys Gln Asp Val Val Leu Ala Met Ala Leu Ala Tyr Val  
115 120 125

Asp Leu Ser Arg Asp Ala Met Ala Ala Ser Pro Pro Asp Val Ile Gly  
130 135 140

Cys Cys Glu Val Leu Glu Arg Ala Leu Lys Leu Leu Gln Glu Asp Gly  
145 150 155 160

Ala Ser Asn Leu Ala Pro Asp Leu Leu Ser Gln Ile Asp Glu Thr Leu  
165 170 175

Glu Glu Ile Thr Pro Arg Cys Val Leu Glu Leu Leu Ser Leu Pro Ile  
 180 185 190

Asp Thr Glu His His Lys Lys Arg Gln Glu Gly Leu Gln Gly Ala Arg  
 195 200 205

Asn Ile Leu Trp Ser Val Gly Arg Gly Gly Ile Ala Thr Val Gly Gly  
 210 215 220

Gly Phe Ser Arg Glu Ala Phe Met Asn Glu Ala Phe Leu Arg Met Thr  
 225 230 235 240

Ser Ile Glu Gln Met Asp Phe Phe Ser Lys Thr Pro Asn Ser Ile Pro  
 245 250 255

Pro Glu Trp Phe Glu Ile Tyr Asn Val Ala Leu Ala His Val Ala Gln  
 260 265 270

Ala Ile Ile Ser Lys Arg Pro Gln Phe Ile Met Met Ala Asp Asp Leu  
 275 280 285

Phe Glu Gln Leu Gln Lys Phe Asn Ile Gly Ser His Tyr Ala Tyr Asp  
 290 295 300

Asn Glu Met Asp Leu Ala Leu Glu Arg Ala Phe Cys Ser Leu Leu Val  
 305 310 315 320

Gly Asp Val Ser Lys Cys Arg Met Trp Leu Gly Ile Asp Asn Glu Ser  
 325 330 335

Ser Pro Tyr Arg Asp Pro Lys Ile Leu Glu Phe Ile Val Thr Asn Ser  
 340 345 350

Ser Ile Ser Glu Glu Asn Asp Leu Leu Pro Gly Leu Cys Lys Leu Leu  
 355 360 365

Glu Thr Trp Leu Ile Phe Glu Val Phe Pro Arg Ser Arg Asp Thr Arg  
 370 375 380

Gly Met Gln Phe Arg Leu Gly Asp Tyr Tyr Asp Asp Pro Glu Val Leu  
 385 390 395 400

Ser Tyr Leu Glu Arg Met Glu Gly Gly Gly Ala Ser His Leu Ala Ala  
 405 410 415

Ala Ala Ala Ile Ala Lys Leu Gly Ala Gln Ala Thr Ala Ala Leu Gly



420	425	430
Thr Val Lys Ser Asn Ala Ile Gln Ala Phe Asn Lys Val Phe Pro Leu		
435	440	445
Ile Glu Gln Leu Asp Arg Ser Ala Met Glu Asn Thr Lys Asp Gly Pro		
450	455	460
Gly Gly Tyr Leu Glu Asn Phe Asp Gln Glu Asn Ala Pro Ala His Asp		
465	470	475
Ser Arg Asn Ala Ala Leu Lys Ile Ile Ser Ala Gly Ala Leu Phe Ala		
485	490	495
Leu Leu Ala Val Ile Gly Ala Lys Tyr Leu Pro Arg Lys Arg Pro Leu		
500	505	510
Ser Ala Ile Arg Ser Glu His Gly Ser Val Ala Val Ala		
515	520	525
<210> 123		
<211> 578		
<212> PRT		
<213> Arabidopsis thaliana		
<400> 123		
Arg Pro Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu		
1	5	10
Gly Ala Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu		
20	25	30
Ala Arg Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu		
35	40	45
Ile Ser Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn		
50	55	60
Pro Arg Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu		
65	70	75
Ala Thr Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu		
85	90	95
Cys Val Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly		
100	105	110

-106-

Ser Asn Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu  
 370 375 380

Glu Thr Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys  
 385 390 395 400

Asp Lys Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu  
 405 410 415

Ser Tyr Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala  
 420 425 430

Ala Ala Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala  
 435 440 445

Met Gln Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn  
 450 455 460

Ser Ala Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro  
 465 470 475 480

Val Gly Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala  
 485 490 495

Glu Ala Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile  
 500 505 510

Arg Ala Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met  
 515 520 525

Ser Val Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala  
 530 535 540

Gly Val Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu  
 545 550 555 560

Lys Ser Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu  
 565 570 575

Ser Asp

<210> 124  
 <211> 99  
 <212> PRT  
 <213> Solanum tuberosum

<400> 124

Pro Ser Asp His His Ile Ser Met Pro Ile Asp Phe Tyr Arg Val Leu  
1 5 10 15

Gly Ala Glu Ala His Phe Leu Gly Asp Gly Ile Arg Arg Cys Tyr Asp  
20 25 30

Ala Arg Ile Thr Lys Pro Pro Gln Tyr Gly Tyr Ser Gln Glu Ala Leu  
35 40 45

Ile Gly Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ala Asp  
50 55 60

Ser Thr Ser Arg Arg Glu Tyr Asn Gln Gly Leu Ala Gln His Glu Phe  
65 70 75 80

Asp Thr Ile Leu Thr Pro Val Pro Trp Asp Lys Val Pro Gly Ala Met  
85 90 95

Cys Val Leu

<210> 125

<211> 760

<212> PRT

<213> Oryza sativa

<400> 125

Met Glu Gly Phe His Asn Leu Leu Ala Arg Pro Asn Ser Ala Pro Phe  
1 5 10 15

Ala Phe Ser Leu Pro Arg Pro Arg Pro Arg Pro Arg Arg Arg Pro Pro  
20 25 30

Pro His Pro Ser Ala Ala Cys Arg Ala Ala Ser Arg Trp Ala Glu Arg  
35 40 45

Leu Phe Ala Asp Phe His Leu Leu Pro Thr Ala Ala Pro Ser Asp Pro  
50 55 60

Pro Ser Pro Ala Pro Ala Pro Ala Ala Pro Ser Ala Ser Pro Phe  
65 70 75 80

Val Pro Leu Phe Pro Asp Ala Ala Glu Arg Ser Leu Pro Leu Gln Val  
85 90 95

Asp Phe Tyr Lys Val Leu Gly Ala Glu Pro His Phe Leu Gly Asp Gly

100										105										110										
Ile	Arg	Arg	Ala	Phe	Glu	Ala	Arg	Ile	Ala	Lys	Pro	Pro	Gln	Tyr	Gly															
		115					120					125																		
Tyr	Ser	Thr	Asp	Ala	Leu	Val	Gly	Arg	Arg	Gln	Met	Leu	Gln	Ile	Ala															
	130					135					140																			
His	Asp	Thr	Leu	Met	Asn	Gln	Asn	Ser	Arg	Thr	Gln	Tyr	Asp	Arg	Ala															
145					150					155					160															
Leu	Ser	Glu	Asn	Arg	Glu	Glu	Ala	Leu	Thr	Met	Asp	Ile	Ala	Trp	Asp															
				165					170					175																
Lys	Glu	Ala	Gly	Glu	Ala	Leu	Ala	Val	Leu	Val	Thr	Gly	Glu	Gln	Leu															
			180					185					190																	
Leu	Leu	Asp	Arg	Pro	Pro	Lys	Arg	Phe	Lys	Gln	Asp	Val	Val	Leu	Ala															
		195					200					205																		
Met	Ala	Leu	Ala	Tyr	Val	Asp	Leu	Ser	Arg	Asp	Ala	Met	Ala	Ala	Ser															
	210					215				220																				
Pro	Pro	Asp	Val	Ile	Gly	Cys	Cys	Glu	Val	Leu	Glu	Arg	Ala	Leu	Lys															
225					230					235					240															
Leu	Leu	Gln	Glu	Asp	Gly	Ala	Ser	Asn	Leu	Ala	Pro	Asp	Leu	Leu	Ser															
				245					250					255																
Gln	Ile	Asp	Glu	Thr	Leu	Glu	Glu	Ile	Thr	Pro	Arg	Cys	Val	Leu	Glu															
			260					265					270																	
Leu	Leu	Ser	Leu	Pro	Ile	Asp	Thr	Glu	His	His	Lys	Lys	Arg	Gln	Glu															
		275					280					285																		
Gly	Leu	Gln	Gly	Ala	Arg	Asn	Ile	Leu	Trp	Ser	Val	Gly	Arg	Gly	Gly															
	290					295					300																			
Ile	Ala	Thr	Val	Gly	Gly	Gly	Phe	Ser	Arg	Glu	Ala	Phe	Met	Asn	Glu															
305					310					315					320															
Ala	Phe	Leu	Arg	Met	Thr	Ser	Ile	Glu	Gln	Met	Asp	Phe	Phe	Ser	Lys															
				325					330					335																
Thr	Pro	Asn	Ser	Ile	Pro	Pro	Glu	Trp	Phe	Glu	Ile	Tyr	Asn	Val	Ala															
			340					345					350																	

Leu Ala His Val Ala Gln Ala Ile Ile Ser Lys Arg Pro Gln Phe Ile  
 355 360 365

Met Met Ala Asp Asp Leu Phe Glu Gln Leu Gln Lys Phe Asn Ile Gly  
 370 375 380

Ser His Tyr Ala Tyr Asp Asn Glu Met Asp Leu Ala Leu Glu Arg Ala  
 385 390 395 400

Phe Cys Ser Leu Leu Val Gly Asp Val Ser Lys Cys Arg Met Trp Leu  
 405 410 415

Gly Ile Asp Asn Glu Ser Ser Pro Tyr Arg Asp Pro Lys Ile Leu Glu  
 420 425 430

Phe Ile Val Thr Asn Ser Ser Ile Ser Glu Glu Asn Asp Leu Leu Pro  
 435 440 445

Gly Leu Cys Lys Leu Leu Glu Thr Trp Leu Ile Phe Glu Val Phe Pro  
 450 455 460

Arg Ser Arg Asp Thr Arg Gly Met Gln Phe Arg Leu Gly Asp Tyr Tyr  
 465 470 475 480

Asp Asp Pro Glu Val Leu Ser Tyr Leu Glu Arg Met Glu Gly Gly Gly  
 485 490 495

Ala Ser His Leu Ala Ala Ala Ala Ala Ile Ala Lys Leu Gly Ala Gln  
 500 505 510

Ala Thr Ala Ala Leu Gly Thr Val Lys Ser Asn Ala Ile Gln Ala Phe  
 515 520 525

Asn Lys Val Phe Pro Leu Ile Glu Gln Leu Asp Arg Ser Ala Met Glu  
 530 535 540

Asn Thr Lys Asp Gly Pro Gly Gly Tyr Leu Glu Asn Phe Asp Gln Glu  
 545 550 555 560

Asn Ala Pro Ala His Asp Ser Arg Asn Ala Ala Leu Lys Ile Ile Ser  
 565 570 575

Ala Gly Ala Leu Phe Ala Leu Leu Ala Val Ile Gly Ala Lys Tyr Leu  
 580 585 590

Pro Arg Lys Arg Pro Leu Ser Ala Ile Arg Ser Glu His Gly Ser Val  
 595 600 605

Ala Val Ala Asn Ser Val Asp Ser Thr Asp Asp Pro Ala Leu Asp Glu  
610 615 620

Asp Pro Val His Ile Pro Arg Met Asp Ala Lys Leu Ala Glu Asp Ile  
625 630 635 640

Val Arg Lys Trp Gln Ser Ile Lys Ser Lys Ala Leu Gly Pro Glu His  
645 650 655

Ser Val Ala Ser Leu Gln Glu Val Leu Asp Gly Asn Met Leu Lys Val  
660 665 670

Trp Thr Asp Arg Ala Ala Glu Ile Glu Arg His Gly Trp Phe Trp Glu  
675 680 685

Tyr Thr Leu Ser Asp Val Thr Ile Asp Ser Ile Thr Ile Ser Leu Asp  
690 695 700

Gly Arg Arg Ala Thr Val Glu Ala Thr Ile Asp Glu Ala Gly Gln Leu  
705 710 715 720

Thr Asp Val Thr Glu Pro Arg Asn Asn Asp Ser Tyr Asp Thr Lys Tyr  
725 730 735

Thr Thr Arg Tyr Glu Met Ala Phe Ser Lys Leu Gly Gly Trp Lys Ile  
740 745 750

Thr Glu Gly Ala Val Leu Lys Ser  
755 760

<210> 126

<211> 2283

<212> DNA

<213> Oryza sativa

<400> 126

```

atggaggggt tccacaacct cctcgcccg cccaactcgg cgccattcgc cttctccctc      60
cctcgcccg gcccgcgcc gcgccgcagg ccgcccgcctc acccctccgc tgctgcccgc      120
gccgcgagcc gctgggcccga acgcctcttc gccgacttcc acctcctccc caccgccgcg      180
ccctccgacc cgccgtcccc ggccccggcc ccggccgcgg cgccctccgc ctcccccttc      240
gtcccgtctt tccccgacgc cgccgaacgc tccctcccgc tccaagtcca tttctacaag      300
gttctagggg cagagccaca tttccttggc gatggcatca ggagggcggt cgaggcacgg      360
atagccaagc caccgcagta tggctacagc acggatgctc ttgttggtcg tcgacaaatg      420
ctgcagattg cccatgacac tctcatgaac cagaactccc gcactcagta tgatcgtgcg      480

```

etttctgaga accgtgaaga agctctcacc atggatattg cttgggacaa ggaggctggg	540
gaggcacttg ctgtgcttgt aactggagaa cagttgcttc tggatcggcc acccaagcgc	600
ttcaagcagg acgtggtgct agcgatggct ctggcttatg tggatctatc aagggatgct	660
atggcagcaa gccctccaga tgtaattggc tgctgcgagg tgctcgagag ggctctcaag	720
ctcttgccagg aagatggagc aagcaatctc gcacctgacg tgccttcaca gattgatgaa	780
actctcgagg agattacacc tcgctgtgta ttggagcttc tctcccttcc tattgacaca	840
gagcatcata agaagcgcca agaagggtt caagggtgca gaaacatttt gtggagcgtt	900
ggcagaggag gtattgctac cgttggagga ggattttctc gtgaagcctt catgaacgag	960
gcttttttga ggatgacatc aattgaacag atggatttct tttcaaaaac accgaatagc	1020
attcctcctg aatggtttga aatttacaat gtagcacttg cacatgtcgc tcaagcaatt	1080
ataagtaaaa ggccacaatt catcatgatg gcggatgatc tttttgaaca actccagaag	1140
ttcaacatag gttctcatta tgcttatgat aatgagatgg accttgcatt ggaaagggca	1200
ttctgctcat tgctagtcgg agatgttagc aagtgcagaa tgtggcttgg aattgataat	1260
gagtcttcac catacagaga ccccaaaatt ctagagttta ttgtgaccaa ctctagcatc	1320
agtgaagaga atgatcttct tccagggtg tgcaagcttt tggagacttg gcttatcttt	1380
gaggtttttc ctaggagcag agatactcgg ggcatgcagt tcagacttgg agattactac	1440
gatgatccag aagttttaag ctacctagaa aggatggagg gtggtggtgc ttctcatttg	1500
gctgctgctg ctgctattgc aaaacttggg gctcaagcta cagctgcact tggactgtg	1560
aaatcaaagc ctattcaagc gttcaacaag gtttttccat tgatagaaca gttagacagg	1620
tcagccatgg aaaatactaa agatggccct gggggatatac ttgaaaattt tgaccaggaa	1680
aatgcacctg ctcatgattc gagaaatgcc gccttgaaga ttatctctgc tggcgactg	1740
tttgactgtg tggcagtaat tggggccaaa tatttgctc gtaagaggcc cctttctgct	1800
attaggagtg agcatggatc tgtggcagtt gctaatagtg tcgactctac tgatgatcct	1860
gcactagatg aagatccagt acatattcct agaatggatg cgaagctggc agaagatatt	1920
gttcgcaagt ggcagagtat caaatctaag gccttgggac cagaacattc ggttgcatca	1980
ttgcaagagg ttcttgatgg caacatgcta aagggtgtgga ctgaccgagc agcggagatt	2040
gagcgtcatg ggtggttctg ggagtataca ctatccgatg tgacgattga tagcatcact	2100
atctccctag atggtcgacg agcgactgtg gaggctacga ttgatgaggc aggccaactt	2160
actgatgtta ctgagcccag aaacaatgat tcatatgaca caaaatacac taccgggtat	2220
gagatggcct tctccaagct aggaggggtg aagataacgg aaggagcagt cctcaagtcg	2280
tag	2283



<210> 127  
 <211> 801  
 <212> PRT  
 <213> Arabidopsis thaliana

<400> 127

Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu  
 1 5 10 15

Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His Asn Thr  
 20 25 30

Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser  
 35 40 45

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Ser Phe Ala Thr Ala  
 50 55 60

Thr Thr Thr Ala Thr Leu Val Ser Pro Pro Pro Ser Ile Asp Arg Pro  
 65 70 75 80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala  
 85 90 95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg  
 100 105 110

Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser  
 115 120 125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg  
 130 135 140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr  
 145 150 155 160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val  
 165 170 175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala  
 180 185 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu  
 195 200 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu  
 210 215 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu  
 225 230 235 240  
 Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg  
 245 250 255  
 Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu  
 260 265 270  
 Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu  
 275 280 285  
 Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly  
 290 295 300  
 Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu-Lys Phe Met Asn  
 305 310 315 320  
 Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu Phe Val  
 325 330 335  
 Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val  
 340 345 350  
 Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu  
 355 360 365  
 Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val  
 370 375 380  
 Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp  
 385 390 395 400  
 Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly  
 405 410 415  
 Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser  
 420 425 430  
 Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn  
 435 440 445  
 Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr  
 450 455 460  
 Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys  
 465 470 475 480

Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr  
485 490 495

Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala Ala  
500 505 510

Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln  
515 520 525

Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala  
530 535 540

Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly  
545 550 555 560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala  
565 570 575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala  
580 585 590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val  
595 600 605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val  
610 615 620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser  
625 630 635 640

Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp  
645 650 655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro  
660 665 670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys  
675 680 685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro  
690 695 700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala  
705 710 715 720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu

725

730

735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val  
740 745 750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro  
755 760 765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val  
770 775 780

Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala  
785 790 795 800

Ser

<210> 128

<211> 2406

<212> DNA

<213> Arabidopsis thaliana

<400> 128

```

atggaagctc tgagtcacgt cggcattggt ctctcccat tccaattatg ccgattacca      60
ccggcgacga caaagctccg acgtagccac aacacctcta caactatctg ctccgccagc    120
aaatgggccc accgtcttct ctccgacttc aatttcacct ccgattcctc ctctcctccc    180
ttcgccaccg ccaccaccac cgccactctc gtctctccgc caccatctat tgatcgtccc    240
gaacgccacg tccccatccc cattgatttc taccaggat taggagctca aacacatttc    300
ttaaccgatg gaatcagaag agcattcgaa gctagggttt cgaaaccgcc gcaattcggg    360
ttcagcgacg acgctttaat cagccggaga cagattcttc aagctgcttg cgaaactctg    420
tctaactctc ggtctagaag agagtacaat gaaggctctt ttgatgatga agaagctaca    480
gtcatcactg atgttccttg ggataagggt cctggtgctc tctgtgtatt gcaagaagg    540
ggtgagactg agatagttct tcgggttggt gaggctctgc ttaaggagag gttgcctaag    600
tcgtttaagc aagatgtggt tttagttatg gcgcttgctt ttctcgatgt ctcgagggat    660
gctatggcat tggatccacc tgattttata actggttatg agtttggtga ggaagctttg    720
aagcttttac aggaggaagg agcaagtagc cttgcaccgg atttacgtgc acaaattgat    780
gagactttgg aagagatcac tccgcgttat gtcttggagc tacttggctt accgcttgg    840
gatgattacg ctgcgaaaag actaaatggt ttaagcgggtg tgcggaatat tttgtggtct    900
gttggaggag gtggagcatc agctcttggt gggggtttga cccgtgagaa gtttatgaat    960
gaggcgtttt tacgaatgac agctgctgag caggttgatc tttttgtagc taccccaagc   1020

```

aatattccag	cagagtcatt	tgaagtttac	gaagttgcac	ttgctcttgt	ggctcaagct	1080
tttattggta	agaagccaca	ccttttacag	gatgctgata	agcaattcca	gcaacttcag	1140
caggctaagg	taatggctat	ggagattcct	gcgatgttgt	atgatacacg	gaataattgg	1200
gagatagact	tcggtctaga	aaggggactc	tgtgcactgc	ttataggcaa	agttgatgaa	1260
tgccgtatgt	ggttgggctt	agacagtgag	gattcacaat	ataggaatcc	agctattgtg	1320
gagtttgttt	tggagaattc	aaatcgtgat	gacaatgatg	atctccctgg	actatgcaaa	1380
ttgttgga	cctgggtggc	aggggttgtc	tttcctaggt	tcagagacac	caaagataaa	1440
aaatttaaac	tcggggacta	ctatgatgat	cctatggttt	tgagttactt	ggaaagagtg	1500
gaggtagttc	agggttctcc	tttagctgct	gctgcagcta	tggcaaggat	tggagccgag	1560
catgtgaaa	ctagtgtctat	gcaggcactg	cagaaaagttt	ttccttcccc	ctatacagat	1620
agaaaactcg	ctgaacccaa	ggatgtgcaa	gagacagtgt	ttagtgtaga	tcctgttggg	1680
aacaatgtag	gccgtgatgg	tgagcctggg	gtctttattg	cagaagctgt	aagaccctct	1740
gaaaactttg	aaactaatga	ttatgcaatt	cgagctgggg	tctcagagag	tagcgttgat	1800
gaaactactg	ttgaaatgtc	cgttgctgat	atgttaaagg	aggcaagtgt	gaagatccta	1860
gctgctggtg	tggcaattgg	actgatttca	ctgttcagcc	agaagtattt	tcttaaaagc	1920
agctcatctt	ttcaacgcaa	ggatatgggt	tettctatgg	aatctgatgt	cgctaccata	1980
gggtcagtca	gagctgacga	ttcagaagca	cttcccagaa	tggatgctag	gactgcagag	2040
aatatagtat	ccaagtggca	gaagattaag	tctctggctt	ttgggcctga	tcaccgcata	2100
gaaatgttac	cagaggtttt	ggatgggcca	atgctgaaga	tttggactga	cagagcagct	2160
gaaactgctc	agcttgggtt	ggtttatgat	tatacactgt	tgaaactatc	tgttgacagt	2220
gtgacagtct	cagcagatgg	aaccctgtct	ctgggtggaag	caactctgga	ggagtctgct	2280
tgtctatctg	atttggttca	tccagaaaac	aatgctactg	atgtcagaac	ctacacaaca	2340
agatacgaag	ttttctggtc	caagtcaggg	tggaaaatca	ctgaaggctc	tgttcttgca	2400
tcataa						2406

<210> 129  
 <211> 801  
 <212> PRT  
 <213> Arabidopsis thaliana

<400> 129

Met	Glu	Ala	Leu	Ser	His	Val	Gly	Ile	Gly	Leu	Ser	Pro	Phe	Gln	Leu
1				5					10					15	

Cys	Arg	Leu	Pro	Pro	Ala	Thr	Thr	Lys	Leu	Arg	Arg	Ser	His	Asn	Thr
			20					25					30		

Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser  
35 40 45

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Ser Phe Ala Thr Ala  
50 55 60

Thr Thr Thr Ala Thr Leu Val Ser Pro Pro Pro Ser Ile Asp Arg Pro  
65 70 75 80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala  
85 90 95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg  
100 105 110

Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser  
115 120 125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg  
130 135 140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr  
145 150 155 160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val  
165 170 175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala  
180 185 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu  
195 200 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu  
210 215 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu  
225 230 235 240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg  
245 250 255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu  
260 265 270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu

275					280					285					
Asn	Gly	Leu	Ser	Gly	Val	Arg	Asn	Ile	Leu	Trp	Ser	Val	Gly	Gly	Gly
290						295					300				
Gly	Ala	Ser	Ala	Leu	Val	Gly	Gly	Leu	Thr	Arg	Glu	Lys	Phe	Met	Asn
305					310					315					320
Glu	Ala	Phe	Leu	Arg	Met	Thr	Ala	Ala	Glu	Gln	Val	Asp	Leu	Phe	Val
				325					330					335	
Ala	Thr	Pro	Ser	Asn	Ile	Pro	Ala	Glu	Ser	Phe	Glu	Val	Tyr	Glu	Val
			340					345					350		
Ala	Leu	Ala	Leu	Val	Ala	Gln	Ala	Phe	Ile	Gly	Lys	Lys	Pro	His	Leu
		355					360					365			
Leu	Gln	Asp	Ala	Asp	Lys	Gln	Phe	Gln	Gln	Leu	Gln	Gln	Ala	Lys	Val
	370					375					380				
Met	Ala	Met	Glu	Ile	Pro	Ala	Met	Leu	Tyr	Asp	Thr	Arg	Asn	Asn	Trp
385					390					395					400
Glu	Ile	Asp	Phe	Gly	Leu	Glu	Arg	Gly	Leu	Cys	Ala	Leu	Leu	Ile	Gly
				405					410					415	
Lys	Val	Asp	Glu	Cys	Arg	Met	Trp	Leu	Gly	Leu	Asp	Ser	Glu	Asp	Ser
			420					425					430		
Gln	Tyr	Arg	Asn	Pro	Ala	Ile	Val	Glu	Phe	Val	Leu	Glu	Asn	Ser	Asn
		435					440					445			
Arg	Asp	Asp	Asn	Asp	Asp	Leu	Pro	Gly	Leu	Cys	Lys	Leu	Leu	Glu	Thr
	450					455					460				
Trp	Leu	Ala	Gly	Val	Val	Phe	Pro	Arg	Phe	Arg	Asp	Thr	Lys	Asp	Lys
465					470					475					480
Lys	Phe	Lys	Leu	Gly	Asp	Tyr	Tyr	Asp	Asp	Pro	Met	Val	Leu	Ser	Tyr
				485					490					495	
Leu	Glu	Arg	Val	Glu	Val	Val	Gln	Gly	Ser	Pro	Leu	Ala	Ala	Ala	Ala
			500					505					510		
Ala	Met	Ala	Arg	Ile	Gly	Ala	Glu	His	Val	Lys	Ala	Ser	Ala	Met	Gln
		515					520					525			

Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala  
530 535 540

Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly  
545 550 555 560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala  
565 570 575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala  
580 585 590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val  
595 600 605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val  
610 615 620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser  
625 630 635 640

Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp  
645 650 655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro  
660 665 670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys  
675 680 685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro  
690 695 700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala  
705 710 715 720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu  
725 730 735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val  
740 745 750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro  
755 760 765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val  
770 775 780



Phe	Trp	Ser	Lys	Ser	Gly	Trp	Lys	Ile	Thr	Glu	Gly	Ser	Val	Leu	Ala
785					790					795					800

Ser

<210> 130  
 <211> 2637  
 <212> DNA  
 <213> Arabidopsis thaliana

<400> 130

gatttaactt atactactca aaatcaaaat tccataaacc ctagacgacc aaacagtctc	60
ttcaatatgt aaaacagaac aaagtttttg tagtagccta aaaagacact cccatggaag	120
ctctgagtca cgtcggcatt ggtctctccc cattccaatt atgccgatta ccaccggcga	180
cgacaaaagct ccgacgtagc cacaacacct ctacaactat ctgctccgcc agcaaatggg	240
ccgaccgtct tctctccgac ttcaatttca cctccgattc ctctctctcc tccttcgccca	300
ccgccaccac caccgccact ctgctctctc cgccaccatc tattgatcgt cccgaacgcc	360
acgtcccat cccattgat ttctaccagg tattaggagc tcaaacacat ttcttaaccg	420
atggaatcag aagagcattc gaagctaggg ttctgaaacc gccgcaattc ggtttcagcg	480
acgacgcttt aatcagccgg agacagattc ttcaagctgc ttgcgaaact ctgtctaac	540
ctcggcttag aagagagtac aatgaaggct ttcttgatga tgaagaagct acagtcatca	600
ctgatgttcc ttgggataag gttcctgggtg ctctctgtgt attgcaagaa ggtggtgaga	660
ctgagatagt tcttcggggtt ggtgaggctc tgcttaagga gaggttgctt aagtcgttta	720
agcaagatgt ggttttagtt atggcgcttg cgtttctcga tgtctcgagg gatgctatgg	780
cattggatcc acctgatttt ataactgggtt atgagtttgt tgaggaagct ttgaagcttt	840
tacaggagga aggagcaagt agccttgac cggaattacg tgcacaaatt gatgagactt	900
tggaagagat cactccgcgt tatgtcttgg agctacttgg cttaccgctt ggtgatgatt	960
acgctgcgaa aagactaaat ggtttaagcg gtgtgcggaa tatttttgtgg tctgttgag	1020
gaggtggagc atcagctctt gttggggggtt tgaccctga gaagtttatg aatgaggcgt	1080
ttttacgaat gacagctgct gagcagggtg atctttttgt agctacccca agcaatattc	1140
cagcagagtc atttgaagtt tacgaagttg cacttgctct tgtggctcaa gcttttattg	1200
gtaagaagcc acacctttta caggatgctg ataagcaatt ccagcaactt cagcaggcta	1260
aggtaatggc tatggagatt cctgcgatgt tgtatgatac acggaataat tgggagatag	1320
acttcggtct agaaagggga ctctgtgcac tgcttatagg caaagttgat gaatgccgta	1380
tgtggttggg cttagacagt gaggattcac aatataggaa tccagctatt gtggagtttg	1440

```

ttttggagaa ttcaaatcgt gatgacaatg atgatctccc tggactatgc aaattgttgg 1500
aaacctgggtt ggcaggggtt gtctttccta ggttcagaga caccaaagat aaaaaattta 1560
aactcgggga ctactatgat gatcctatgg ttttgagtta cttggaaaga gtggaggtag 1620
ttcaggggttc tccttttagct gctgctgcag ctatggcaag gattggagcc gagcatgtga 1680
aagctagtgc tatgcaggca ctgcagaaaag tttttccttc ccgctataca gatagaaact 1740
cggctgaacc caaggatgtg caagagacag tgtttagtgt agatcctgtt ggtaacaatg 1800
taggccgtga tggtgagcct ggtgtcttta ttgcagaagc tgtaagaccc tctgaaaact 1860
ttgaaaactaa tgattatgca attcgagctg gggctctcaga gagtagcgtt gatgaaacta 1920
ctgttgaaat gtccgttgct gatatgttaa aggaggcaag tgtgaagatc ctagctgctg 1980
gtgtgggcaat tggactgatt tcaactgttca gccagaagta ttttcttaaa agcagctcat 2040
cttttcaacg caaggatatg gtttcttcta tggaatctga tgtcgctacc atagggtcag 2100
tcagagctga cgattcagaa gcacttccca gaatggatgc taggactgca gagaatatag 2160
tatccaagtg gcagaagatt aagtctctgg cttttgggcc tgatcacccg atagaaatgt 2220
taccagaggt tttggatggg cgaatgctga agatttggac tgacagagca gctgaaactg 2280
cgcagcttgg gttggtttat gattatacac tgttgaaact atctgttgac agtgtgacag 2340
tctcagcaga tggaacccgt gctctggtgg aagcaactct ggaggagtct gcttgtctat 2400
ctgatttggg tcatccagaa aacaatgcta ctgatgtcag aacctacaca acaagatacg 2460
aagttttctg gtccaagtca gggtggaata tcaactgaagg ctctgttctt gcatcataat 2520
atactcatat gtagcatgtc tgagcttgcg agattctctt tgttttgtaa attctctctc 2580
taagtttagtg tttataaatg aacacaaaaa aattaacggt caaaaaaaaa aaaaaaa 2637

```

```

<210> 131
<211> 801
<212> PRT
<213> Arabidopsis thaliana

```

```

<400> 131

```

```

Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu
1           5           10           15

```

```

Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His Asn Thr
20           25           30

```

```

Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser
35           40           45

```

```

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Ser Phe Ala Thr Ala
50           55           60

```

Thr Thr Thr Ala Thr Leu Val Ser Pro Pro Pro Ser Ile Asp Arg Pro  
65 70 75 80

Glu Arg His Val Pro Ile Pro Ile Asp Phe Tyr Gln Val Leu Gly Ala  
85 90 95

Gln Thr His Phe Leu Thr Asp Gly Ile Arg Arg Ala Phe Glu Ala Arg  
100 105 110

Val Ser Lys Pro Pro Gln Phe Gly Phe Ser Asp Asp Ala Leu Ile Ser  
115 120 125

Arg Arg Gln Ile Leu Gln Ala Ala Cys Glu Thr Leu Ser Asn Pro Arg  
130 135 140

Ser Arg Arg Glu Tyr Asn Glu Gly Leu Leu Asp Asp Glu Glu Ala Thr  
145 150 155 160

Val Ile Thr Asp Val Pro Trp Asp Lys Val Pro Gly Ala Leu Cys Val  
165 170 175

Leu Gln Glu Gly Gly Glu Thr Glu Ile Val Leu Arg Val Gly Glu Ala  
180 185 190

Leu Leu Lys Glu Arg Leu Pro Lys Ser Phe Lys Gln Asp Val Val Leu  
195 200 205

Val Met Ala Leu Ala Phe Leu Asp Val Ser Arg Asp Ala Met Ala Leu  
210 215 220

Asp Pro Pro Asp Phe Ile Thr Gly Tyr Glu Phe Val Glu Glu Ala Leu  
225 230 235 240

Lys Leu Leu Gln Glu Glu Gly Ala Ser Ser Leu Ala Pro Asp Leu Arg  
245 250 255

Ala Gln Ile Asp Glu Thr Leu Glu Glu Ile Thr Pro Arg Tyr Val Leu  
260 265 270

Glu Leu Leu Gly Leu Pro Leu Gly Asp Asp Tyr Ala Ala Lys Arg Leu  
275 280 285

Asn Gly Leu Ser Gly Val Arg Asn Ile Leu Trp Ser Val Gly Gly Gly  
290 295 300

Gly Ala Ser Ala Leu Val Gly Gly Leu Thr Arg Glu Lys Phe Met Asn

305		310		315		320
Glu Ala Phe Leu Arg Met Thr Ala Ala Glu Gln Val Asp Leu Phe Val						
		325		330		335
Ala Thr Pro Ser Asn Ile Pro Ala Glu Ser Phe Glu Val Tyr Glu Val						
		340		345		350
Ala Leu Ala Leu Val Ala Gln Ala Phe Ile Gly Lys Lys Pro His Leu						
		355		360		365
Leu Gln Asp Ala Asp Lys Gln Phe Gln Gln Leu Gln Gln Ala Lys Val						
		370		375		380
Met Ala Met Glu Ile Pro Ala Met Leu Tyr Asp Thr Arg Asn Asn Trp						
385		390		395		400
Glu Ile Asp Phe Gly Leu Glu Arg Gly Leu Cys Ala Leu Leu Ile Gly						
		405		410		415
Lys Val Asp Glu Cys Arg Met Trp Leu Gly Leu Asp Ser Glu Asp Ser						
		420		425		430
Gln Tyr Arg Asn Pro Ala Ile Val Glu Phe Val Leu Glu Asn Ser Asn						
		435		440		445
Arg Asp Asp Asn Asp Asp Leu Pro Gly Leu Cys Lys Leu Leu Glu Thr						
		450		455		460
Trp Leu Ala Gly Val Val Phe Pro Arg Phe Arg Asp Thr Lys Asp Lys						
		465		470		475
Lys Phe Lys Leu Gly Asp Tyr Tyr Asp Asp Pro Met Val Leu Ser Tyr						
		485		490		495
Leu Glu Arg Val Glu Val Val Gln Gly Ser Pro Leu Ala Ala Ala Ala						
		500		505		510
Ala Met Ala Arg Ile Gly Ala Glu His Val Lys Ala Ser Ala Met Gln						
		515		520		525
Ala Leu Gln Lys Val Phe Pro Ser Arg Tyr Thr Asp Arg Asn Ser Ala						
		530		535		540
Glu Pro Lys Asp Val Gln Glu Thr Val Phe Ser Val Asp Pro Val Gly						
		545		550		555
						560

Asn Asn Val Gly Arg Asp Gly Glu Pro Gly Val Phe Ile Ala Glu Ala  
565 570 575

Val Arg Pro Ser Glu Asn Phe Glu Thr Asn Asp Tyr Ala Ile Arg Ala  
580 585 590

Gly Val Ser Glu Ser Ser Val Asp Glu Thr Thr Val Glu Met Ser Val  
595 600 605

Ala Asp Met Leu Lys Glu Ala Ser Val Lys Ile Leu Ala Ala Gly Val  
610 615 620

Ala Ile Gly Leu Ile Ser Leu Phe Ser Gln Lys Tyr Phe Leu Lys Ser  
625 630 635 640

--- Ser Ser Ser Phe Gln Arg Lys Asp Met Val Ser Ser Met Glu Ser Asp  
645 650 655

Val Ala Thr Ile Gly Ser Val Arg Ala Asp Asp Ser Glu Ala Leu Pro  
660 665 670

Arg Met Asp Ala Arg Thr Ala Glu Asn Ile Val Ser Lys Trp Gln Lys  
675 680 685

Ile Lys Ser Leu Ala Phe Gly Pro Asp His Arg Ile Glu Met Leu Pro  
690 695 700

Glu Val Leu Asp Gly Arg Met Leu Lys Ile Trp Thr Asp Arg Ala Ala  
705 710 715 720

Glu Thr Ala Gln Leu Gly Leu Val Tyr Asp Tyr Thr Leu Leu Lys Leu  
725 730 735

Ser Val Asp Ser Val Thr Val Ser Ala Asp Gly Thr Arg Ala Leu Val  
740 745 750

Glu Ala Thr Leu Glu Glu Ser Ala Cys Leu Ser Asp Leu Val His Pro  
755 760 765

Glu Asn Asn Ala Thr Asp Val Arg Thr Tyr Thr Thr Arg Tyr Glu Val  
770 775 780

Phe Trp Ser Lys Ser Gly Trp Lys Ile Thr Glu Gly Ser Val Leu Ala  
785 790 795 800

Ser

<210> 132  
 <211> 561  
 <212> DNA  
 <213> *Arabidopsis thaliana*

<220>  
 <221> misc feature  
 <222> (127)..(127)  
 <223> n is a, c, g, or t

<220>  
 <221> misc feature  
 <222> (520)..(520)  
 <223> n is a, c, g, or t

<220>  
 <221> misc feature  
 <222> (541)..(541)  
 <223> n is a, c, g, or t

<400> 132  
 ataaacacta acttagagag agaatttaca aaacaaagag aatctcgcaa gctcagacat 60  
 gctacatatg agtatattat gatgcaagaa cagagccttc agtgattttc caccctgact 120  
 tggaccngaa aacttcgtat cttgttgtgt aggttctgac atcagtagca ttgttttctg 180  
 gatgaaccaa atcagataga caagcagact cctccagagt tgcttccacc agagcacggg 240  
 ttccatctgc tgagactgtc aactgtcaa cagatagttt caacagtgtg taatcataaa 300  
 ccaacccaag ctgcgaggtt tcagctgctc tgtcagtcca aatcttcagc attcgcccat 360  
 ccaaaacctc tggtaacatt tctatgcggt gatcaggccc aaaagccaga gacttaatct 420  
 tctgccactt ggatactata ttctctgcag tcctagcatc cattctggga agtgcttctg 480  
 aatcgtcagc tctgactgac cctatggtag cgacatcagn ttccatagaa gaaacatat 540  
 ncttgcgttg aaaagatgag c 561

<210> 133  
 <211> 295  
 <212> DNA  
 <213> *Medicago truncatula*

<400> 133  
 ctggtgtagc aattggactc ataacttttag ctggtttgaa gattttacct tctaaaaatg 60  
 gctcgcccggt tcttcacaaa gtgactgggt cagcaattgc gtcagatact atcaatttag 120  
 gtcctgtagg agatgaagaa ttaggagagc aactacaaaa aatgagtgca atgggtgcag 180  
 aagctctagt ccgcaagtgg caatatatca catcccaagc ttttggacct gaccattgcc 240  
 taggaagatt gcaagaggtg ttggacggcc aaatgttgaa gatatggact gatcg 295

<210> 134

<211> 527  
 <212> DNA  
 <213> Medicago truncatula

<400> 134  
 cccaagcttt tggacctgac cattgcctag gaagattgca agaggtgttg gacggcgaaa 60  
 tgttgaagat atggactgat cgagcagctg agattgcaga gcttggttgg tcatatgact 120  
 acaacttgga ggatctcaac atcgacagtg tgaccatata acagaatggg cggcgtgcag 180  
 tagtggaaac aactctcaaa gagtctaccc acctcactgc tgttggtcat ccacagcatg 240  
 ctacttccaa cagcagaacc tacacaacaa gatatgaaat gtctttttca gattcagggg 300  
 ggaaaattat tgaaggagct gtccttgagt cgtaattagg ttttgtaata tgtaatatat 360  
 gtcagggttag tacacttcaa tattaacccc ctcgagccta tgcccactgt cttgtatgta 420  
 cctgttgttt tgtgcatttt tcaagcattt atgtagtcag gctgtaaata cttggagggg 480  
 atttgatcaa ataattatcc gggttaaaaaa aaaaaaaaaa aaaaaaa 527

<210> 135  
 <211> 660  
 <212> DNA  
 <213> Medicago truncatula

<400> 135  
 cacgcttctc caaaaaacct aaccgtctcc attcctccgc cgtctccgcc accagtaaata 60  
 gggcgaggagc actcatttcc gatttccaat tctcggcgca cacctcctct tctcctcca 120  
 ccaccacctc cgccacagtc actctcactc cttcttaccc tctcgcgata gaacgccacg 180  
 tgtcactccc tctcgacctg tacaaaaatcc tcggcgccga aacgcatttt ctcggtgatg 240  
 gtattcggag agcttatgaa gcgaaattct cgaagcctcc tcagtatgct ttcagtaatg 300  
 aagctttgat tagtcgtcgt cagattcttc aagctgcttg tgaaacccta gctgatcctg 360  
 cttctagaag agagtataat caaagcctcg tcgacgatga agacgaagat gaggaatctt 420  
 ccattctcac tgaaatccct ttcgacaaaag ttcctggagc tctgtgcgtg ttgcaagaag 480  
 ctggagagac ggagttggtg cttcggattg gagggggttt actgagagag aggttaccga 540  
 agatgtttta gcaagatgtt gtgttggtta tggcgcttgc atatgttgac gtttctaggg 600  
 atgctatggc tttgtccccg ccagatttca ttgttgcttg tgagatgctg gaaagggcat 660

<210> 136  
 <211> 187  
 <212> DNA  
 <213> Glycine max

<400> 136  
 agcgttgtgt gtgttcagc aagctggaga gacggagctt gtgcttgaga ttgggcaggg 60  
 tttgcttagg gagaggttgc cgaagacgtt taagcaggat gttgtgttgg ctatggcact 120

cgcatTTgtt gacgtgtcaa gggatgcttg gcttgttcac cggatttcat tgcggctgtg 180  
agatgct 187

<210> 137  
<211> 608  
<212> DNA  
<213> Solanum tuberosum

<400> 137  
ggaaaGcttc cttaacaatg gaggcattaa cacagctaag ctttggcatt tgtactccac 60  
gcctttcatc accatttcaa ctagccgccg ccggtggtaa gaagccgccg agactcaatg 120  
ccgttaacgg aggagctagt agtgttaccg gtggaacaag tagtttacct actaacttct 180  
ccgctagtaa atgggcggat cgtcttctcg ccgatttcca attccttcct tccaccacca 240  
cctccgactc atcggatttc cagaattcaa cttctacaac ctccgttacg actattcctc 300  
ctcctgttgc tccttcagac caccacattt caatgcctat agacttttat agagtgttg 360  
gtgctgaagc tcacttcctc ggtgacggta ttaggagatg ctacgatgct agaattacaa 420  
agcctccgca gtacggatac agtcaggaag cattgattgg ccgacggcag attcttcaag 480  
ctgcttgtga aacccttgct gactctacct ctcgtagaga gtacaatcaa ggcctcgctc 540  
agcatgagtt cgatactatt ctaactcctg tcccctggga taaagttccg ggagcaatgt 600  
gtgttttg 608

<210> 138  
<211> 307  
<212> DNA  
<213> Populus balsamifera

<400> 138  
gaagatttca tgaatgaggc cttcttacgt atgacagcag ctgagcaggc tgatctgttc 60  
gtcaccacgc caagtaatat cccggctcaa aattttgaag tttatggagt ggcacttgcc 120  
cttgttgccc aagctttcat tggtaaaaag cctcatctca tcacagatgc tgataaccta 180  
ttcggacagc ttcagcagat taaggtaaca aatcaaggga gtcttgttcc tgtctttggt 240  
tccatggaaa accgtgatat tgactttggg ttggagaggg gctttgttca ctgcttgtag 300  
gccagct 307

<210> 139  
<211> 416  
<212> DNA  
<213> Mesembryanthemum crystallinum

<400> 139  
gggaaacgtg ccttggtgga agcaactctt caagaatcag cgcagttaac tgacgttaac 60  
caacctgagc ataacgattc ttacagcaga acatacaca caaggtacga gatgtttcac 120



tccaatgctg ggtggaagat catagagggg gctgtcctcc aatcttaage tgctggaaat	180
ccagtcttga atgtacatat ttccacatca tctgcacatt atgaatgaag gatggatatgt	240
gttttctgga cagtgggtatt tgatcatgtt gtgtttatgt ttgtaacaag ttttgatcat	300
tatcaaaaaag atcactcttg taagttagtt ttttccacaa taaatcaact atttatatga	360
aagtttttat atcagggacta cttgccttta cttatataaa ctttgagaaa tttttt	416

<210> 140  
 <211> 465  
 <212> DNA  
 <213> Oryza sativa

<220>  
 <221> misc\_feature  
 <222> (113)..(113)  
 <223> n is a, c, g, or t

<400> 140	
tggtgcttct catttgggct gctgctgctg ctattgcaaa acttggtgct caagctacag	60
ctgcacttgg tactgtgaaa tcaaagtcta ttcaagcgtt caacaagggt ttnccattga	120
tagaacagtt agacagggtca gccatggaaa atactaaaga tggccctggg ggatatcttg	180
aaaattttga ccaggaaaaat gcacctgctc atgattcgag aaatgccgcc ttgaagatta	240
tctctctggc gcactgtttg cactgttggc agtaattggg gccaaatatt tgccctegtaa	300
gaggccctt tctgctatta ggagtgaaga tggatctgtg gcagttgcta atagtgtcga	360
ctctactgat gatcctgcac tagatgaaga tccagtacat attcctagaa tggatgcgaa	420
gctggcagaa gatattgttc gcaagtggca gagtatcaaa tctaa	465

<210> 141  
 <211> 309  
 <212> DNA  
 <213> Oryza sativa

<400> 141	
atcataagaa gcgccaagaa gggcttcaag gtgcgagaaa cattttgtgg agcgttggca	60
gaggaggtat tgctaccgtt ggaggaggat tttctcgtga agccttcatt aacgaggctt	120
ttttgaggat gacatcaatt gaacagatgg atttcttttc aaaaacaccg aatagcatte	180
ctcctgaatg gtttgaaatt tacaatgtag cacttgcaca tgtcgtcaa gcaattataa	240
gtaaaaggcc acaattcatc atgatggcgg atgatctttt tgaacaacte cagaagttcc	300
acataggctc	309

<210> 142  
 <211> 336  
 <212> DNA

<213> Oryza sativa

<400> 142

```
atcataagaa ggcgaagaa gggcttcaag gtgcgagaaa cattttgtgg agcgttggca      60
gaggaggtat tgctaccggt ggaggaggat tttctcgtga agccttcatg aacgaggctt      120
ttttgaggat gacatcaatt gaacagatgg atttcttttc aaaaacaccg aatagcattc      180
ctcctgaatg gtttgaaatt tacaatgtag cacttgcaca tgctcgtcaa gcaattataa      240
gtaaaaggcc acaattcatc atgatggcgg atgatctttt tgaacaactc cagaagttca      300
acatagggtc tcattatgct tatgataatg agatgg                                     336
```

<210> 143

<211> 537

<212> DNA

<213> Triticum aestivum

<400> 143

```
cagtgccttg aattggaggg cacttactgg aggaccgccc gcccaagcgg ttcaagcagg      60
atgtggtgct ggcaatggcg ctgcgttatg tggatctatc aagggacgca atggcgggcta      120
gccctccaga tgtaatccgc tgctgtgagg tgcttgaaaag ggctctcaag cttttgcagg      180
aggatggggc aatcaatctc gcacctggtt tgctctcaca aattgatgaa actctggagg      240
atatcacacc tcgttgtgtt ttggagcttc ttgcccttcc tcttgatgaa aaacatcaga      300
atgaacacca agaaggtctt cgtggtgtga gaaacatttt gtggagtgtt ggagaggag      360
gtattggtac tgttggagga ggattttcgc gtgaagccta catgaatgaa gccttcctgc      420
agatgacatc ggcggagcag atggatttct tctcaaaaac accgaatagc ataccgcctg      480
aatggtttga aatctatagc gtggcacttg caaatgttgc tcaagcaatt gtaagta       537
```

<210> 144

<211> 418

<212> DNA

<213> Triticum monococcum

<220>

<221> misc feature

<222> (144)..(144)

<223> n is a, c, g, or t

<220>

<221> misc feature

<222> (301)..(301)

<223> n is a, c, g, or t

<400> 144

```
acacctcgtt gtgttttggg gcttcttgcc cttcctcttg atgaaaagca ccagagtaaa      60
cgccaagaag gtcttcgtgg tgtgagaaac attttgtgga gtgttggtag aggaggtatt      120
```

gctactgttg gaggaggatt ttcncgtgaa gcctacatga atgaggcctt tttgcagatg	180
acatcagcgg agcagatgga tttcttttca aaaacgccaa atagcatacc acctgaatgg	240
tttgaaatct atagtgtggc actcgcaa at gttgctcaag caattgtaag taaaaggcca	300
nagctcatca tgggtggcaga tgatcttttc gaacagctcc agaagttcaa tataggttct	360
caatatgctt atgataatga attggatctt gtgttgga gggcactttg ctcattgc	418

<210> 145  
 <211> 480  
 <212> DNA  
 <213> Hordeum vulgare

<400> 145	
gcgagcatga gtccgtggca gttgcta atg ttgttgactc aggtgatgat gacgaaccag	60
atgagcccat acagattcct aaaatggatg cgaagctggc agaagatatt gttcgcaagt	120
ggcagagcat caaatccaag gccttgggat cagatcattc tggtgcatca ttgcaagagg	180
ttcttgatgg caacatgctg aaggatgga cggaccgagc agcagagatc gagcgcaaag	240
gctggttctg ggactacacg ctgtccaacg tggcgatcga cagcatcacc gtctccctgg	300
acggacggcg ggcgaccgtg gaggcgacaa ttgaggaggc gggtcagctc accgacgcaa	360
ccgaccccag gaacgatgat ttgtacgaca ctaagtacac caccgggtac gagatggcct	420
tcaccggacc agggagggtg aagataaccg aaggcgagc cctcaagtcg tcatagggcg	480

<210> 146  
 <211> 622  
 <212> DNA  
 <213> Hordeum vulgare

<220>  
 <221> misc\_feature  
 <222> (11)..(12)  
 <223> n is a, c, g, or t

<220>  
 <221> misc\_feature  
 <222> (14)..(14)  
 <223> n is a, c, g, or t

<220>  
 <221> misc\_feature  
 <222> (65)..(65)  
 <223> n is a, c, g, or t

<220>  
 <221> misc\_feature  
 <222> (88)..(88)  
 <223> n is a, c, g, or t

<400> 146	
gaaactctgg nngnagatca cccctcggtg tggttttagag cttcttgccc ttcctcttga	60

cgagnaagca ccagagtaaa cgccaagnaa ggtcttcgtg gtgtgagaaa ctttttgtgg	120
agtgttggtta gaggaggtat tgctactgtt ggtggaggat tttcacggga agcctacatg	180
aatgaggcct ttttgcatg gacatcagct gagcagatgg atttcttttc aaaaacgccg	240
aatagcatac cacctgaatg gtttgaaatc tatagcgtgg cactcgcaaa tgttgctcaa	300
gcaattgtaa gtaaaaaggcc agagctcatc atggtggcag atgatctttt cgaacagctc	360
cagaagttca atatcgggtc tcaatatgct tatggtaacg agatggatct tgcgttgtaa	420
agggcacttt gctcattgct tgtggggagac attagcaact gcagaacttg gcttgcgatt	480
gataatgaat cttcaccaca tagagacccg aaaattgtag agttttattgt gaacaactct	540
agcattgacc accaggagaa tgatcttctt ccaggcctgt gtaagctttt ggagacttgg	600
cttgtctcag aggttttccc ta	622

<210> 147  
 <211> 604  
 <212> DNA  
 <213> Hordeum vulgare

<220>  
 <221> misc\_feature  
 <222> (13)..(13)  
 <223> n is a, c, g, or t

<220>  
 <221> misc\_feature  
 <222> (516)..(516)  
 <223> n is a, c, g, or t

<400> 147	
tggtctcacc tgnaaatcca gcactaagtt tctcttatca ccaacccaag gatctcttct	60
agcctagcaa taatccgaat agaacacacc gaaaaacaaa gctcatcgct gactaactga	120
ctaaccaaaac tatctccgtc ttccaaaactg acaagagcct agactagact gcttattttac	180
acaccagaaa aacacgggag gaatcaatca acaagggttta ctgcacgctg aacgccctat	240
gacgacttga ggactgcgcc ttcggttatc ttccaccctc ctgggtccggt gaaggccatc	300
tcgtaccggg tgggtgtactt agtgtcgtag aaatcatcgt tcctgggggtc ggttgcgtag	360
gtgagctgac ccgcctcctc aattgtcgcc tccacggctc cccgccgtcc gtccaggagg	420
acggtgatgc tgctgatcgc cacgttgaac agcgtgtagt cccagaacca gcctttgcgc	480
tcaatctctg ctgctcggtc tgtccatacc ttcagnatgt tgccatcaag aacctcttgc	540
aatgatgcaa cagaatgatc tgatcccaag gccttggatt tgatgctctg ccacttgcca	600
acaa	604

<210> 148

<211> 653  
 <212> DNA  
 <213> Sorghum bicolor

<400> 148  
 tatgggtctg tggcagttgc tgactctgtt gatgggtctgg gagcagatga agagccacta 60  
 gaaattccta gaatggatgc aaagttaggt gaagatattg ttcgcaagtg gcaaagtatc 120  
 aagtccaagg ctttggggcc agaacacact gtcacggcat tgcaagagat cctcgatggc 180  
 aacatgctga aggtatggat ggaccgagcc acagagattg agcgtcacgg ttggttctgg 240  
 gaatacacac tctccgacgt gacgatcgac agtatcaccg tctccatgga cggtcgacgg 300  
 gcaactgtgg aggcgacgat tgaggagatg ggccaactta ccgacgtagc agacccaaag 360  
 aacaacgacg cctacgacac aaagtacacc gtcggtacg agatgagcta ctccaagtcc 420  
 ggagggtgga ggatcaccga aggagcagtc ctcaagtcgt agaacggtcg tgcagcagga 480  
 gtaggcgagt aggggttgct caactcccat tcttttttct tttgcaccag tgtatgtaaa 540  
 taaacagtgt gagcacaggt tcttttctct cctggagaga gtttggttag gttgattagt 600  
 gatgagttcc tgaggccgag agaatttgtc atctagtttg tattgataga gat 653

<210> 149  
 <211> 535  
 <212> DNA  
 <213> Sorghum bicolor

<400> 149  
 gcacgaggat agaacagcta gacagatcag gcaaggatac cccaggtgat gatcttgaga 60  
 aatctcttga aaaacttgcc caagaaatgt tgctggagat gctatccatg attccaaaaa 120  
 tgccgctttg aagattatct ctgctggtgc actgtttgca ctatttgag taataggtct 180  
 gaagtgcttg cctcgtaaga agtcacttcc tgctcttaag agcgaatatg ggtctgtggc 240  
 agttgctgac tctgttgatg gtctgggagc agatgaagag ccactagaaa ttcctagaat 300  
 ggatgcaaag ttggctgaag atattgttcg caagtggcaa agtatcaagt ccaaggcttt 360  
 ggggccagaa cacactgtca cggcattgca agagatcctc gatggcaaca tgctgaaggt 420  
 atggatggac cgagccacag agattgagcg tcacggttgg ttctgggaat acacactctc 480  
 cgacgtgacg atcgacagta tcaccgtctc catggacggg cgacgggcaa ctgtg 535

<210> 150  
 <211> 479  
 <212> DNA  
 <213> Zea mays

<400> 150  
 gccacaggcc gccaccgctt gggccctcca cctgccgctc cgccagccgc tgggccgacc 60  
 gcctcttcgc cgacttccac ctctctcccc cgccgcca cccgccagcc gcggcctcct 120

cttctctctc	gtccccgttc	gtccccgatct	tccccgaagc	cgccgaccgc	gccttgcccc	180
tccccggtcga	cttctacaag	attcttggtg	cggagccaca	tttcctaggc	gatggcattc	240
ggagggcggtt	cgagtcgcgg	atagctaagc	cacctcagta	tgggtacagc	acagaagctc	300
ttgctggggcg	acggcaaatg	ctgcagattg	cccatgatac	tctcaciaaac	cagagctcgc	360
gcaccgagta	cgaccgtgcg	ctttccgagg	accgtgatgc	ggcactcacc	atggatgttg	420
cctgggataa	ggttccaggt	gtgctgcgtg	tgcttcagga	ggctggggag	gcacaactg	479

<210> 151  
 <211> 446  
 <212> DNA  
 <213> Zea mays

<400> 151	
agcaatgtgg	gcaagtgcga cactatagat ctcaaaccat tcagggtggtg tgctattcgg 60
tgtttttagag	aagaaatcca tctgctcagc tgatgtcatc tgcaagaaag cctcattcat 120
gaaggcctca	cgagaaaaatc ctctccaac agtagcaata ccacccctgc caacactcca 180
caatatgttt	tttgacctt gcagaccttc ttggcgttta tttttatgtt tttcatcagt 240
aggaagagca	agaagctcca atacacaacg aggtgtaatc tcctccaaag tttcatcaat 300
ctgtgcaagc	agttcagggtg caagattgct tgcaccatcc tcctgcagga gcttcagtgc 360
cctctcaagc	acctcacaac agcagattac atctggaggg cttgctgcca tagcatccct 420
tgatatgtcc	acataagcca atgcca 446

<210> 152  
 <211> 657  
 <212> DNA  
 <213> Zea mays

<400> 152	
cgcgtcgacg	tatagagtct gcatccatgt tgcttgaat gaagcgtctg caaaagaagg 60
ctcttttatc	accagtcgtg tcaggaagca ttttgaaaat atatcaaaat ttctttggct 120
gagtgatagg	cctaattcaa atagcaaagg aagtgataaa caccagcgg ttaatgatat 180
tactgctgca	gtttgcaagc aaaagatgga tattcaagaa gcagaaacac ttgtaaaaca 240
gtggcaagac	ataaaaatctg aagctcttgg ccctgactat caaactgaca tgctacctga 300
gattcttgat	ggttcaatgc tctctaagtg ggaagactta gcgttattag caaaggacca 360
gtcttgctat	tggagatttg tgctgctaaa tcttaatgtt gttcgagccg agataatctt 420
ggatgaaata	ggtgctgggtg aggcagcaga aattgatgct gtacttgagg aagcggctga 480
gcttgttgac	gattcccagc ccaagaaacc gagttattac agcacatatg aagttcagta 540
cgtattgagg	aggcagaatc atggatcttg gaaaatctcc gaggctgctg tccgggacct 600

gacgtgattt etgccaactc ggcaaacggg ctacacaacc attggcgtat aggcgge 657

<210> 153  
 <211> 871  
 <212> DNA  
 <213> Ceratopteris richardii

<400> 153  
 gtgggtgtctt tgctcgtgtt cctggataca caagggatga gtatatgaag gcagcttttt 60  
 ctgcaatgac agctgctgag caagtagctt tgttcacaaa tacaccagc aatatccag 120  
 cagagagttc tgaggtttac acagttgctc ttgctcacat agcagaggga tttgttgcaa 180  
 agaagccgca attgattcag gaagctgatt cactctttct tcagcttcag cgaacaaatg 240  
 cctcatcatc tagtttgcta gttactggtg gtctacggcc attatcaagt ctgcagcttg 300  
 attttgcttt tgaacgagcc atgtgcaaac tgctcctagg agaactggat gggtgtcgtg 360  
 catggctagg tttggatgat acaaactctc catatagaga ccctgcagtg actgattttg 420  
 ttatagctaa ttcttttgga agtgaggaag gtgattatgt accaggcctt tgcaagtgtg 480  
 tggaaagtgt gttgaggga gcggtgtttt tcccaaccc gtcaacagaa aagtggagg 540  
 acaagttgag ggagtatttt ttatgatgca aggagaaaaa aagccgccgt gaattttttc 600  
 gcggggggcg ctatgaaaaa atatattcaa cctttttttg ttggggcgctc gtctacaaag 660  
 aatgatggag tgtcattgtt gcttttgagg tgacgaagg gggcgctcc tctttaagg 720  
 atcgtccgtg ggggcgcgcg ctcccatatc gccatcttcg ggacaccttg ttcgtgggtc 780  
 aaatggtgat gtctttttta ccacgaacgt cacattatc ttataatata agcgtgcggc 840  
 agcactctca gcttcgacga aacagcctaa a 871

<210> 154  
 <211> 541  
 <212> DNA  
 <213> Physcomitrella patens

<400> 154  
 gagaacggaa gctttagaag tggaggttgt ccccaaaatg gatgctagg tggcggaat 60  
 tatggttcga agatggcaag cagctaaagc tcgagcactt ggttctgctc atgatatggc 120  
 ggctcttcct gaggtgctgg agggcgagat gctgaagage tggacagacc gtgttagtga 180  
 cgtcaagaga aatggttggg tttgggaata cactctectt ggtcttcaca ttgatagtgt 240  
 aacagtaagt gacgatggga ggcgagcaac tgcggaagcc actttgcaag aggcagcccc 300  
 cttggtggac cgcaacaacc ctgaccacaa tgattcttat agaagcactt acactacgcg 360  
 atatgacctc cggcatggca tagatggttg gcgaatcaat ggaggagctg tgctgcgtac 420  
 ttgattctga gattttcatc tccggatcat gttgacttgt aggcagatcg actagttgca 480

acccttgcac gctacgaatg agtagtcttt ttggatattt tgatccatca tgcagctttg 540  
a 541

<210> 155  
<211> 2109  
<212> DNA  
<213> *Protochlorococcus marinus* MED4

<400> 155  
ttggaacttc cattagatca ctttcgttta ataggcgtaa gcccctcagc aacatctgag 60  
gaaatattaa gggctttcca attacgcttg gataaaactc ctgatgaagg attcacgtac 120  
gagggttttaa ctcaaaggtc ggaattgctt cgccttactg cagatttgct tacagatcca 180  
gatagtagaa gagattacga aaatttatta ctaaatggag catcagggtt agatttatct 240  
tccaatagag aggttgcagg attaattctc ctttgggaat cgggctcttc taaagaagcc 300  
tttaaaataa caagaaaagc attgcaaccc ccccaaactc ctgcattggg tagcagtaga 360  
gaagctgac ttaccttggt agcggcttta acatctagag atgctgcaat acaagagcaa 420  
gatcaaagat ctactcaaa tgctgcagat tttttacaag aaggcataca gcttcttcaa 480  
agaatgggca aactagggga attacggaaa actcttgagg aggacttagt gtcgcttctt 540  
ccgtatcgaa ttcttgattt gttaagtaga gatctaaatg attatgactc gcataaaaaa 600  
ggtttaagta tgctggaaaa ttaataatc aaaagagggt gattagaagg aaaaaataaa 660  
tctgaatata atgattttct aaatcagcaa gaatttgaat ctttctttca acaataaaag 720  
ccattcttga ctgttcagga tcagatagat ttatttttag aattacaaaa aaggggttca 780  
agtgaagcag gatttttagc ttttttatct ttaacagcaa ttggttttgc aagaagaaaa 840  
cctgcaaaat tattcgaaag tcgaaaaata ttaaaaaaac taaatttatc aggacttgac 900  
tcaatgccat taatagggtg ccttgatttg ctttttagcag atgttgagca atcctcagca 960  
agggttttaa gtagttccga tgagaagtta agagattggt tgaataatta tcctggagaa 1020  
aaattagaag caatatgtat tttttgtaaa aattgggttag aaaatgatgt tttgggtggt 1080  
tatagggata ttgatttaaa agaaatcgat ttagactctt ggtttgaaga tagagaaatc 1140  
caagaattta ttgagcaaat agaaaagaag tcaaatagaa ctgtgtttta gtctgggcct 1200  
caaaaataaac ctatttttca agcccaagaa tctttaaaag attcaagtac gggccctgat 1260  
ttaaattcgg ataattttga agaaggccga ttacctttgc ctggaggagt aagagaagat 1320  
ggatcaagaag ttattgaaga aaatatttat acagatgaga ttattaaaaa caaatcaata 1380  
gaattttata agtacgcaat agaaaaaatt gctgaattaa aatttgtatt tggagaagcc 1440  
ttagagaact acagaatatt taataaatct tcctacctaa catatctgta tgcttttttg 1500  
attttatttg cttttggcct aggtgttggg tttgtaagaa ataatctcaa aaaaccctg 1560



caggaaaaag aaataattga taactcggtta tcgataaatg aaaataagaa tgtcttttat 1620  
gaagggtttaa atcaagatga taaaaagaaa gttctcgata actcaaaaat tattctctca 1680  
gataatgcag aaaaagttat tttttcaggt gaagaaataa aaactgcttc tccctcctta 1740  
gaaaaaatag aaaatttaat taatacatgg cttgttaaca aaagtaaatt tctagcagga 1800  
aaagggtgaaa ttaatttatc aaagatagtt caagatgatt tgattgatag attaaagaag 1860  
gaaagagaac ttgatattca aaaagggtatc tacaaaaata tcaatgctaa tatcgaaaat 1920  
attgtacttt taactcaaac ggcatcaaga atatcagtat cagttgactt aaagtattca 1980  
gaaaaaatat taaaaataga tggggaattg ataaatgaaa caactttcac tccttttttg 2040  
aaagttaa atatttttagg tttctcaa aactcctgga aattagttga ctacattagt 2100  
ggtgttttag 2109

<210> 156  
<211> 702  
<212> PRT  
<213> *Protochlorococcus marinus* MED4

<400> 156

Leu Glu Leu Pro Leu Asp His Phe Arg Leu Ile Gly Val Ser Pro Ser  
1 5 10 15

Ala Thr Ser Glu Glu Ile Leu Arg Ala Phe Gln Leu Arg Leu Asp Lys  
20 25 30

Thr Pro Asp Glu Gly Phe Thr Tyr Glu Val Leu Thr Gln Arg Ser Glu  
35 40 45

Leu Leu Arg Leu Thr Ala Asp Leu Leu Thr Asp Pro Asp Ser Arg Arg  
50 55 60

Asp Tyr Glu Asn Leu Leu Leu Asn Gly Ala Ser Gly Leu Asp Leu Ser  
65 70 75 80

Ser Asn Arg Glu Val Ala Gly Leu Ile Leu Leu Trp Glu Ser Gly Ser  
85 90 95

Ser Lys Glu Ala Phe Lys Ile Thr Arg Lys Ala Leu Gln Pro Pro Gln  
100 105 110

Thr Pro Ala Leu Gly Ser Ser Arg Glu Ala Asp Leu Thr Leu Leu Ala  
115 120 125

Ala Leu Thr Ser Arg Asp Ala Ala Ile Gln Glu Gln Asp Gln Arg Ser  
130 135 140

Tyr Ser Asn Ala Ala Asp Phe Leu Gln Glu Gly Ile Gln Leu Leu Gln  
145 150 155 160

Arg Met Gly Lys Leu Gly Glu Leu Arg Lys Thr Leu Glu Glu Asp Leu  
165 170 175

Val Ser Leu Leu Pro Tyr Arg Ile Leu Asp Leu Leu Ser Arg Asp Leu  
180 185 190

Asn Asp Tyr Asp Ser His Lys Lys Gly Leu Ser Met Leu Glu Asn Leu  
195 200 205

Ile Ile Lys Arg Gly Gly Leu Glu Gly Lys Asn Lys Ser Glu Tyr Asn  
210 215 220

Asp Phe Leu Asn Gln Gln Glu Phe Glu Ser Phe Phe Gln Gln Ile Lys  
225 230 235 240

Pro Phe Leu Thr Val Gln Asp Gln Ile Asp Leu Phe Leu Glu Leu Gln  
245 250 255

Lys Arg Gly Ser Ser Glu Ala Gly Phe Leu Ala Phe Leu Ser Leu Thr  
260 265 270

Ala Ile Gly Phe Ala Arg Arg Lys Pro Ala Lys Leu Phe Glu Ala Arg  
275 280 285

Lys Ile Leu Lys Lys Leu Asn Leu Ser Gly Leu Asp Ser Met Pro Leu  
290 295 300

Ile Gly Cys Leu Asp Leu Leu Leu Ala Asp Val Glu Gln Ser Ser Ala  
305 310 315 320

Arg Phe Leu Ser Ser Ser Asp Glu Lys Leu Arg Asp Trp Leu Asn Asn  
325 330 335

Tyr Pro Gly Glu Lys Leu Glu Ala Ile Cys Ile Phe Cys Lys Asn Trp  
340 345 350

Leu Glu Asn Asp Val Leu Val Gly Tyr Arg Asp Ile Asp Leu Lys Glu  
355 360 365

Ile Asp Leu Asp Ser Trp Phe Glu Asp Arg Glu Ile Gln Glu Phe Ile  
370 375 380

Glu Gln Ile Glu Lys Lys Ser Asn Arg Thr Val Phe Lys Ser Gly Pro

385		390		395		400
Gln Asn Lys Pro	Ile Phe Gln Ala Gln Glu Ser Leu Lys Asp Ser Ser					
	405			410		415
Thr Gly Pro Asp	Leu Asn Ser Asp Asn Phe Glu Glu Gly Arg Leu Pro					
	420			425		430
Leu Pro Gly Gly	Val Arg Glu Asp Gly Gln Glu Val Ile Glu Glu Asn					
	435			440		445
Ile Tyr Thr Asp	Glu Ile Ile Lys Asn Lys Ser Ile Glu Phe Tyr Lys					
	450			455		460
Tyr Ala Ile Glu Lys	Ile Ala Glu Leu Lys Phe Val Phe Gly Glu Ala					
465		470		475		480
Leu Glu Asn Tyr	Arg Ile Phe Asn Lys Ser Ser Tyr Leu Thr Tyr Leu					
	485			490		495
Tyr Ala Phe Leu	Ile Leu Phe Ala Phe Gly Leu Gly Val Gly Phe Val					
	500			505		510
Arg Asn Asn Leu Lys Lys	Pro Val Gln Glu Lys Glu Ile Ile Asp Asn					
	515			520		525
Ser Leu Ser Ile Asn Glu	Asn Lys Asn Val Phe Tyr Glu Gly Leu Asn					
	530			535		540
Gln Asp Asp Lys Lys	Lys Val Leu Asp Asn Ser Lys Ile Ile Leu Ser					
545		550		555		560
Asp Asn Ala Glu Lys	Val Ile Phe Ser Gly Glu Glu Ile Lys Thr Ala					
	565			570		575
Ser Pro Ser Leu Glu Lys	Ile Glu Asn Leu Ile Asn Thr Trp Leu Val					
	580			585		590
Asn Lys Ser Lys Phe	Leu Ala Gly Lys Gly Glu Ile Asn Leu Ser Lys					
	595			600		605
Ile Val Gln Asp Asp	Leu Ile Asp Arg Leu Lys Lys Glu Arg Glu Leu					
	610			615		620
Asp Ile Gln Lys Gly	Ile Tyr Lys Asn Ile Asn Ala Asn Ile Glu Asn					
625		630		635		640

Ile Val Leu Leu Thr Gln Thr Ala Ser Arg Ile Ser Val Ser Val Asp  
645 650 655

Leu Lys Tyr Ser Glu Lys Ile Leu Lys Ile Asp Gly Glu Leu Ile Asn  
660 665 670

Glu Thr Thr Phe Thr Pro Phe Leu Lys Val Lys Tyr Ile Leu Gly Phe  
675 680 685

Ser Asn Asn Ser Trp Lys Leu Val Asp Tyr Ile Ser Gly Val  
690 695 700

<210> 157  
<211> 1986  
<212> DNA  
<213> Protochlorococcus marinus MT9313

<400> 157  
gtggacctgc caatagatca tttccgcttg ctgggtgtca gtccttcggc agacagtgag 60  
gcgattttgc gggccttgga gttgaggttg gatcgctgcc ctgaccaagg tttcacccat 120  
gaggtcttaa ttcagcgggc agaattgttg cggctttcag cagatttgct gactgatccg 180  
ccacggcgtc aggcctatga gactgccttg ttggagctca gtcgtgatca tccagggtgag 240  
accgccggtc ttgatgtgtc acctagtaga gaggtggcag ggctgatctt gctgtttgaa 300  
gcgaattctt ctcattgaggt ttttcatctc gcctctcagg gattgcaacc gccccagtcc 360  
ccgacgctag gtagcgaacg agaagctgac ctcgctttgt tgttggcact ggctgtcgg 420  
gctgcagccg ctgaggaaca ggaacaacgg cgttatgaag cagcagcgtc tcttctgcat 480  
gacgggatcc agttgctgca gcggatgggc aagctctccg aagagtgccca caagcttgag 540  
aacgatttag atgcccttct gccctatcgc attctcgact tattgagtcg ggatcttggt 600  
gatcaggttt ctcaccagga aggactgcgc ctacttgaca actttgtgag ccagagagga 660  
ggctcttgagg gaacggcccc atcgccctgca cctgggtggc ttgatcagtc cgaatttgac 720  
aacttcttca agcagatcag aaagttttta actgttcagg aacagggtga tcttttcctg 780  
cgctggcagc aagccggatc agcagatgcg ggtttcctgg gtgggttggc tcttgctgct 840  
gttggatttt cgcgtcggaa gcctgaacgg gtgcaggaag ctccggcagca cttagagagg 900  
cttcaactgg atggatgcga cccgttgccg atgctggggt gcttggacct cttgctcgg 960  
gatgtgggcc gcgctcagga gcgttttctg cgcagtacag atcctcgagt gaaggactgt 1020  
cttaacagcc accctggcga tgaattggct gctttttgtg agtactgccg ctcttggtctg 1080  
cgaggggacg tgcttcccgg ttatagggat gtggatgctg aggccgttga tctagaggct 1140  
tggtttgctg atcgggatgt tcaggcttat gtggagcgcc tggaacgcag cgaaaaatcgt 1200

gcttcttctt taggtaagge ettcctcagga tegtctgtga agcaaccctt cccttggggcg 1260  
cctcttgatc ccgatgggat tttgcccctc tctcttggtg ggcttgatgt tggatcaacct 1320  
gcagctgatc agagctctga tgagtttgcc agcgatggta tggcatggat tgatcgttta 1380  
gcagatctgc cacgcccgcac gcggccggtg ctgatcggtt cggttgtctt tgcggccctg 1440  
attgcagcct ttgcaggcct cagtttggtt ggccaacgtc ctcgtacgtc agttagtacg 1500  
gctgctgatc agcctcaagt cacagcacct cctacagcca cactgcaaga ggaggtcctc 1560  
atgcctcaag tccctgtcag cgctgtgggt gagccgctta ctttgaggca gccgaatgag 1620  
gcacagctca aaggcctgct tcaggcctgg ctacagcaaca aggcagtcgt gcttgccggt 1680  
ggcaagagtg atgcactgcc tgaggtcgca agagatccat tggatgcagc cgtggcgcaa 1740  
gagcgtgcca gggatgctgc tttagctcag acccagaagg ttgtggccag catcagctct 1800  
gtagaggtgg tgagtcgaac gccgcagcgt attgagctga atgccgttgt gacctatcgc 1860  
gatcaacgcg ttgatgctgc cggcaagggt gttgacaaa cgccccaaaa agatctctcg 1920  
gtgacttaca tccttggtcg tgateccgat cgttggcgcc tgcataata catcageggc 1980  
aaataa 1986

<210> 158  
<211> 661  
<212> PRT  
<213> *Protochlorococcus marinus* MT9313

<400> 158

Val Asp Leu Pro Ile Asp His Phe Arg Leu Leu Gly Val Ser Pro Ser  
1 5 10 15

Ala Asp Ser Glu Ala Ile Leu Arg Ala Leu Glu Leu Arg Leu Asp Arg  
20 25 30

Cys Pro Asp Gln Gly Phe Thr His Glu Val Leu Ile Gln Arg Ala Glu  
35 40 45

Leu Leu Arg Leu Ser Ala Asp Leu Leu Thr Asp Pro Pro Arg Arg Gln  
50 55 60

Ala Tyr Glu Thr Ala Leu Leu Glu Leu Ser Arg Asp His Pro Gly Glu  
65 70 75 80

Thr Ala Gly Leu Asp Val Ser Pro Ser Arg Glu Val Ala Gly Leu Ile  
85 90 95

Leu Leu Phe Glu Ala Asn Ser Ser His Glu Val Phe His Leu Ala Ser  
100 105 110

Gln Gly Leu Gln Pro Pro Gln Ser Pro Thr Leu Gly Ser Glu Arg Glu  
 115 120 125

Ala Asp Leu Ala Leu Leu Leu Ala Leu Ala Cys Arg Ala Ala Ala Ala  
 130 135 140

Glu Glu Gln Glu Gln Arg Arg Tyr Glu Ala Ala Ala Ser Leu Leu His  
 145 150 155 160

Asp Gly Ile Gln Leu Leu Gln Arg Met Gly Lys Leu Ser Glu Glu Cys  
 165 170 175

His Lys Leu Glu Asn Asp Leu Asp Ala Leu Leu Pro Tyr Arg Ile Leu  
 180 185 190

Asp Leu Leu Ser Arg Asp Leu Gly Asp Gln Val Ser His Gln Glu Gly  
 195 200 205

Leu Arg Leu Leu Asp Asn Phe Val Ser Gln Arg Gly Gly Leu Glu Gly  
 210 215 220

Thr Ala Pro Ser Pro Ala Pro Gly Gly Leu Asp Gln Ser Glu Phe Asp  
 225 230 235 240

Asn Phe Phe Lys Gln Ile Arg Lys Phe Leu Thr Val Gln Glu Gln Val  
 245 250 255

Asp Leu Phe Leu Arg Trp Gln Gln Ala Gly Ser Ala Asp Ala Gly Phe  
 260 265 270

Leu Gly Gly Leu Ala Leu Ala Ala Val Gly Phe Ser Arg Arg Lys Pro  
 275 280 285

Glu Arg Val Gln Glu Ala Arg Gln His Leu Glu Arg Leu Gln Leu Asp  
 290 295 300

Gly Cys Asp Pro Leu Pro Met Leu Gly Cys Leu Asp Leu Leu Leu Gly  
 305 310 315 320

Asp Val Gly Arg Ala Gln Glu Arg Phe Leu Arg Ser Thr Asp Pro Arg  
 325 330 335

Val Lys Asp Cys Leu Asn Ser His Pro Gly Asp Glu Leu Ala Ala Phe  
 340 345 350

Cys Glu Tyr Cys Arg Ser Trp Leu Arg Gly Asp Val Leu Pro Gly Tyr

355					360					365					
Arg	Asp	Val	Asp	Ala	Glu	Ala	Val	Asp	Leu	Glu	Ala	Trp	Phe	Ala	Asp
	370					375					380				
Arg	Asp	Val	Gln	Ala	Tyr	Val	Glu	Arg	Leu	Glu	Arg	Ser	Glu	Asn	Arg
385					390					395					400
Ala	Ser	Ser	Leu	Gly	Lys	Ala	Phe	Ser	Gly	Ser	Ser	Val	Lys	Gln	Pro
				405					410					415	
Phe	Pro	Trp	Ala	Pro	Leu	Asp	Pro	Asp	Gly	Ile	Leu	Pro	Leu	Ser	Leu
			420					425					430		
Gly	Gly	Pro	Asp	Val	Gly	Gln	Pro	Ala	Ala	Asp	Gln	Ser	Ser	Asp	Glu
		435					440					445			
Phe	Ala	Ser	Asp	Gly	Met	Ala	Trp	Ile	Asp	Arg	Leu	Ala	Asp	Leu	Pro
	450					455					460				
Arg	Pro	Thr	Arg	Pro	Val	Leu	Ile	Gly	Ser	Val	Val	Phe	Ala	Ala	Leu
465					470					475					480
Ile	Ala	Ala	Phe	Ala	Gly	Phe	Ser	Leu	Phe	Gly	Gln	Arg	Pro	Arg	Thr
			485						490					495	
Ser	Val	Ser	Thr	Ala	Ala	Asp	Gln	Pro	Gln	Val	Thr	Ala	Pro	Pro	Thr
			500				505						510		
Ala	Thr	Leu	Gln	Glu	Glu	Val	Leu	Met	Pro	Gln	Val	Pro	Val	Ser	Ala
		515					520					525			
Val	Val	Glu	Pro	Leu	Thr	Leu	Glu	Gln	Pro	Asn	Glu	Ala	Gln	Leu	Lys
	530					535					540				
Gly	Leu	Leu	Gln	Ala	Trp	Leu	Ser	Asn	Lys	Ala	Val	Val	Leu	Ala	Gly
545					550					555					560
Gly	Lys	Ser	Asp	Ala	Leu	Pro	Glu	Val	Ala	Arg	Asp	Pro	Leu	Val	Gln
				565					570					575	
Arg	Val	Ala	Gln	Glu	Arg	Ala	Arg	Asp	Ala	Ala	Leu	Ala	Gln	Thr	Gln
			580					585					590		
Lys	Val	Val	Ala	Ser	Ile	Ser	Ser	Val	Glu	Val	Val	Ser	Arg	Thr	Pro
		595					600					605			

Gln Arg Ile Glu Leu Asn Ala Val Val Thr Tyr Arg Asp Gln Arg Val  
610 615 620

Asp Ala Ala Gly Lys Val Val Asp Gln Thr Pro Gln Lys Asp Leu Ser  
625 630 635 640

Val Thr Tyr Ile Leu Gly Arg Asp Pro Asp Arg Trp Arg Leu His Glu  
645 650 655

Tyr Ile Ser Gly Lys  
660

<210> 159  
<211> 2151  
<212> DNA  
<213> Synechococcus PCC7002

<400> 159  
gtgcgcatc cgctcgacta ttaccgcctc ctatgcgtcc ccgccaagge aaccactgcc 60  
caaattaccc aagcctatcg cgatcgectc tcccaatttc cccgtcgcca acataatgcc 120  
ttggccattg agggccgcaa ccggattatc gagcaagcct ttgaggtgtt atcccaaaca 180  
gaaacccgcg ccgtctacga ccatgagctg tcgggcaata tgtttcgttc cctcgtcccc 240  
agccgtccga aactgccttt tcccgatcgc ccctccagtg acacagagtt agaagccctg 300  
acagcccacc aaccaaccat tgacatcgcg gaaaaagatt tactgggggg actgctgtta 360  
ctcctcgacc tgggggagta cgaattagtg ctgaagtggg ctgcccccta cctcaagggc 420  
aaaggcaagc tgggtcaagga agggaaattt ggggccgtcg aaatcgtcga gcaagaacta 480  
cggctttgtt tggccctggc ccactgggaa ttgagccggg aacagtggct ccaacaacat 540  
tatgaacagg cggctctctc cggtcagaag agtcaagagc tattggtaga tgtggcacia 600  
tttgagacc tccaacagga aattcaaggg gatctcaatc gcctcagacc ctatcaagtt 660  
ctagaacttc tggccctacc cgaatcagaa acccaagagc gacaacgggg cttacaactg 720  
ctccaggaaa tgttgagtgc tcgctggggg attgatggcc agggggacga tcagtcgggt 780  
ctaagtattg atgatttttt gcgctttatc cagcagttac gcagttatct aacggtgcaa 840  
gaacagttgg atctctttgt ggcagaatca aagcgacctt cggcggcagc ggcctacct 900  
gcggtgtatg ctctcttggc tgctgggttt tcgcaacgga aacctgacct ggtcgtgcaa 960  
gccagacccc tattaacacg cctcggcaaa cgccaggatg ttttcttggg gcaatcaatc 1020  
tgcgcccttac ttttaggtca gccgtcggaa gccaatcaac tgtagaaca aagtcaggaa 1080  
caggaggcga tcgcctacat tcaagagcag tctgaggggg caccggatct actcccaggc 1140  
ctatgtctct acggggaaca gtggctgaag acagaggttt tttcccatct ccgcgatctc 1200



```

eggcaaeaggc ttgaagatgg ctctgtttteg ttgaeggctt aettegecga teetgaagtg 1260
cagcaatatc ttgacgatct cctcacggag gctgtcecca caccacacc acatccagac 1320
acagaaagta cagcggcccc gtcggaaaag ccaccggaaa cattacagtc agaaaccggt 1380
gtttcgccgc atcccagtcg tcccgccaaag gttgattcct ttgaggatct cgtcactcaa 1440
actcccgcta cagttccccc ggcaccgcct tctcctgggtg tagcacctgt aactgcggca 1500
ttaaaccag acccggaagc gtcttctgct tcgtcaaaat cagtttcgtc aaaaaagtct 1560
atcgggcctt ggggggcat cgccgctatc gtggggagtg ttttgctggt cgtgggcctg 1620
gtgcgaattht tgtctggcct aactaccag gaacccttac aggtcaccct caacggtgag 1680
ccaccctaa cgatccccag cttagacacc gccgaggcaa ataataatcc ggagaatgga 1740
gcgaccgata caacgacaac gcctgcgctc aatgaggcga tcgccgctga ggtgattcaa 1800
acttggtttg agagtaaagc tagagccttt ggccaagacc gtgatttggc ggctctagaa 1860
aatattttgg cagaaccgtc cctgtccgc tggcgagta gtgccaggc cgtccgcagc 1920
gctggtacct accgcaccta tgaccacagt ttgaccattg aaacggtgag cttcaaccca 1980
gaccaaccca atgtggcgac cgttgaggcc caggtgcagg aaaaggcaga ttattaccgg 2040
gcgaatgggg aacgcgatcc cggccagtcc tatgattctg acctgcgtgt ccgctacagc 2100
ttggtgcgcc aaggcgatcg ctggttgatt cgttcttccc aaaccctgta a 2151

```

```

<210> 160
<211> 716
<212> PRT
<213> Synechococcus PCC7002

```

```

<400> 160

```

```

Met Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Cys Val Pro Ala Lys
1           5           10           15

```

```

Ala Thr Thr Ala Gln Ile Thr Gln Ala Tyr Arg Asp Arg Leu Ser Gln
20           25           30

```

```

Phe Pro Arg Arg Glu His Asn Ala Leu Ala Ile Glu Ala Arg Asn Arg
35           40           45

```

```

Ile Ile Glu Gln Ala Phe Glu Val Leu Ser Gln Thr Glu Thr Arg Ala
50           55           60

```

```

Val Tyr Asp His Glu Leu Ser Gly Asn Met Phe Arg Ser Leu Val Pro
65           70           75           80

```

```

Ser Arg Pro Lys Leu Pro Phe Pro Asp Arg Pro Ser Ser Asp Thr Glu
85           90           95

```

Leu Glu Ala Leu Thr Ala His Gln Pro Thr Ile Asp Ile Ala Glu Lys  
 100 105 110  
 Asp Leu Leu Gly Gly Leu Leu Leu Leu Leu Asp Leu Gly Glu Tyr Glu  
 115 120 125  
 Leu Val Leu Lys Trp Ala Ala Pro Tyr Leu Lys Gly Lys Gly Lys Leu  
 130 135 140  
 Val Lys Glu Gly Lys Phe Gly Ala Val Glu Ile Val Glu Gln Glu Leu  
 145 150 155 160  
 Arg Leu Cys Leu Ala Leu Ala His Trp Glu Leu Ser Arg Glu Gln Trp  
 165 170 175  
 Leu Gln Gln His Tyr Glu Gln Ala Ala Leu Ser Gly Gln Lys Ser Gln  
 180 185 190  
 Glu Leu Leu Val Asp Val Ala Gln Phe Ala Asp Leu Gln Gln Glu Ile  
 195 200 205  
 Gln Gly Asp Leu Asn Arg Leu Arg Pro Tyr Gln Val Leu Glu Leu Leu  
 210 215 220  
 Ala Leu Pro Glu Ser Glu Thr Gln Glu Arg Gln Arg Gly Leu Gln Leu  
 225 230 235 240  
 Leu Gln Glu Met Leu Ser Ala Arg Val Gly Ile Asp Gly Gln Gly Asp  
 245 250 255  
 Asp Gln Ser Gly Leu Ser Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln  
 260 265 270  
 Leu Arg Ser Tyr Leu Thr Val Gln Glu Gln Leu Asp Leu Phe Val Ala  
 275 280 285  
 Glu Ser Lys Arg Pro Ser Ala Ala Ala Ala Tyr Leu Ala Val Tyr Ala  
 290 295 300  
 Leu Leu Ala Ala Gly Phe Ser Gln Arg Lys Pro Asp Leu Val Val Gln  
 305 310 315 320  
 Ala Gln Thr Leu Leu Lys Arg Leu Gly Lys Arg Gln Asp Val Phe Leu  
 325 330 335  
 Glu Gln Ser Ile Cys Ala Leu Leu Leu Gly Gln Pro Ser Glu Ala Asn

340	345	350
Gln Leu Leu Glu Gln Ser Gln Glu Gln Glu Ala Ile Ala Tyr Ile Gln 355 360 365		
Glu Gln Ser Glu Gly Ala Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr 370 375 380		
Gly Glu Gln Trp Leu Lys Thr Glu Val Phe Ser His Phe Arg Asp Leu 385 390 395 400		
Arg Gln Arg Leu Glu Asp Gly Ser Val Ser Leu Thr Ala Tyr Phe Ala 405 410 415		
Asp Pro Glu Val Gln Gln Tyr Leu Asp Asp Leu Leu Thr Glu Ala Val 420 425 430		
Pro Thr Pro Thr Pro His Pro Asp Thr Glu Ser Thr Ala Ala Pro Ser 435 440 445		
Glu Lys Pro Pro Glu Thr Leu Gln Ser Glu Thr Gly Val Ser Pro His 450 455 460		
Pro Ser Arg Pro Ala Lys Val Asp Ser Phe Glu Asp Leu Val Thr Gln 465 470 475 480		
Thr Pro Ala Thr Val Pro Pro Ala Pro Pro Ser Pro Gly Val Ala Pro 485 490 495		
Val Thr Ala Ala Leu Asn Pro Asp Pro Glu Ala Ser Ser Ala Ser Ser 500 505 510		
Lys Ser Val Ser Ser Lys Lys Ser Ile Gly Pro Trp Gly Ala Ile Ala 515 520 525		
Ala Ile Val Gly Ser Val Leu Leu Val Val Gly Leu Val Arg Ile Leu 530 535 540		
Ser Gly Leu Thr Thr Gln Glu Pro Leu Gln Val Thr Leu Asn Gly Glu 545 550 555 560		
Pro Pro Leu Thr Ile Pro Ser Leu Asp Thr Ala Glu Ala Asn Asn Asn 565 570 575		
Pro Glu Asn Gly Ala Thr Asp Thr Thr Thr Pro Ala Leu Asn Glu 580 585 590		

Ala Ile Ala Ala Glu Val Ile Gln Thr Trp Phe Glu Ser Lys Ala Arg  
595 600 605

Ala Phe Gly Gln Asp Arg Asp Leu Ala Ala Leu Glu Asn Ile Leu Ala  
610 615 620

Glu Pro Ser Leu Ser Arg Trp Arg Ser Ser Ala Gln Ala Val Arg Ser  
625 630 635 640

Ala Gly Thr Tyr Arg Thr Tyr Asp His Ser Leu Thr Ile Glu Thr Val  
645 650 655

Ser Phe Asn Pro Asp Gln Pro Asn Val Ala Thr Val Glu Ala Gln Val  
660 665 670

Gln Glu Lys Ala Asp Tyr Tyr Arg Ala Asn Gly Glu Arg Asp Pro Gly  
675 680 685

Gln Ser Tyr Asp Ser Asp Leu Arg Val Arg Tyr Ser Leu Val Arg Gln  
690 695 700

Gly Asp Arg Trp Leu Ile Arg Ser Ser Gln Thr Leu  
705 710 715

<210> 161  
<211> 2469  
<212> DNA  
<213> Synechococcus PCC7942

<400> 161  
cttgccgact aaaggctaag catcgccatt ccttagatta aagcagtctg tcggcggcgc 60  
tgtgccggtt aacaccagtc tgcgctgac agcggcgctt ttctggggct tgcctgtggg 120  
gcgagtaacc gatcgctggg ataagagttg gtgcttcttg ctctcaagaa tagggtttcc 180  
cgtcgcgtat tcccgatcac atccccctgt gtctgctacg gagataacgc cgatcactca 240  
acagaattgg taagttgacg gtcaagttgg gatgatgaag tcggctcaag ctggcgatcc 300  
ggatctgggtg ggtgttctgt gcgtattect ctcgattact accgaattct ctgtgttggc 360  
gtgcaagcct cggcagacaa acttgccgaa agctaccgcg atcgectcaa ccaategecc 420  
tcccatgagt ttccagagct ggcattgcag gcgcggcggc aactcctcga agcagcgatt 480  
gctgagctga gtgatcccg aacagcgcat cgctacgatc gccgcttttt tcagggcggt 540  
ctggaagcga ttgaaccaag cctagaactc gaagactggc agcgaattgg agccctgctg 600  
atcctgctgg aattggggga atacgatcgc gtttcgcaac tggctgagga actcctgcc 660  
gactacgacg cgagcgcaga agtacgcgat cagttcgcgc ggggtgatat cgccttggcg 720

atcgactat cccagcaatc cctcggtcga gaatgccgtc agcaggggtct gtacgaacag	780
gccgcccagc actttggccg cagccagtct gccctagccg atcatcagcg ctttcctgaa	840
ctgagtcgaa ccctgcacca agaacaagga cagctacggc cctatcgcat tttggagcgg	900
ttggcccagc ccttgactgc cgatagcgat cgccagcagg gtttgctggt gttgcaggcg	960
atgttggaagc accggcaggg cattgaaggc cctggggatg atggctcggg gctgaccctt	1020
gataactttt tgatgtttct ccagcaaatt cgcggtatc tgaccctggc tgaacagcag	1080
ttgctgtttg aatcggaagc gcgtcggccc tcgccggctg cgagcttttt tgacctgtac	1140
accctgattg cgcggggctt ttgcgatcac caaccctcgt tgatccatcg cgccagcttg	1200
ctcttgcatg aactcaagag ccgatggat gtgcacatcg aacaggcgat cgccagccta	1260
ttgctcggac agcccgaaga agctgaggcg ctactcgtcc agagccaaga tgaggaaacc	1320
ctcagccaaa tccgtgccct agcccaaggg gaagccctga tcgtcgggtt gtgccgattc	1380
acggaaacct ggctagcgac caaggtattt ccggtttcc gcgacctcaa ggaaaggact	1440
gcgccgtgac agccctactt tgacgacccc gatgtccaga cctatctgga tgcgatcgtg	1500
gagttgccgt ccgatttgat gccaacgccg ctaccctgtg agccgcttga ggtgcgatcg	1560
tcgttgctgg ccaaggaact gccgaccca gcaacgcctg gtgtagctcc accccctcgc	1620
cgccgtcgcc gcgatcgctc cgaacgtcct gctcgcacgg ccaaacgctt gcccttgccc	1680
tggattggtt tgggggttgt ggtggttctc ggcggtggaa caggggtttg ggcttggcga	1740
tcgcgttcca attccacccc gccgacccc ccccccgtgg ttcaaacgct gcctgaggcg	1800
gtacctgccc cttcgcccgc gccagttacc gttgccctcg atcgggctca ggctgaaact	1860
gtgttgcaaa actggttggc cgctaaagct gcagccttgg ggcctcaata cgatcgcgat	1920
cgcttagcga cggtgctgac cggtgagggt ctgcagactt ggcagggttt ttctagccag	1980
caggccaaca cccagctcac atcacagttc gatcacaagt taaccgtcga ctcagttcag	2040
ctcagtgcag gtgatcaacg agcagtagtc caagccaagg tcgatgaagt tgagcaggtc	2100
tatcgaggcg accagctgct cgaaaacgcg cgagatttgg gcttggtgat ccgctaccag	2160
ctcgtgcgag agaacaacat ctggaaaatt gcttcgatta gtttggtgcg ctaggaattc	2220
gcaaggggtg aacccctgc ggtcttttct gtagatcccc tagagcgatc gcagaatgtt	2280
cagcgattcc tggatgtgcg cttgggcatt caagagtga tcaaaaatgt ggcgcacctt	2340
gccctctttg tcgatcacat aagtgcgcg acccggaatc acaaacaggg ttttgggcac	2400
gccatagggt tgacggaggc gatcgctcgc atcgctcagc agttggaagg gcaagttgta	2460
tttctgggc	2469

<210> 162

<211> 631  
 <212> PRT  
 <213> Synechococcus PCC7942

<400> 162

Met Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Cys Val Gly Val Gln  
 1 5 10 15

Ala Ser Ala Asp Lys Leu Ala Glu Ser Tyr Arg Asp Arg Leu Asn Gln  
 20 25 30

Ser Pro Ser His Glu Phe Ser Glu Leu Ala Leu Gln Ala Arg Arg Gln  
 35 40 45

Leu Leu Glu Ala Ala Ile Ala Glu Leu Ser Asp Pro Glu Gln Arg Asp  
 50 55 60

Arg Tyr Asp Arg Arg Phe Phe Gln Gly Gly Leu Glu Ala Ile Glu Pro  
 65 70 75 80

Ser Leu Glu Leu Glu Asp Trp Gln Arg Ile Gly Ala Leu Leu Ile Leu  
 85 90 95

Leu Glu Leu Gly Glu Tyr Asp Arg Val Ser Gln Leu Ala Glu Glu Leu  
 100 105 110

Leu Pro Asp Tyr Asp Ala Ser Ala Glu Val Arg Asp Gln Phe Ala Arg  
 115 120 125

Gly Asp Ile Ala Leu Ala Ile Ala Leu Ser Gln Gln Ser Leu Gly Arg  
 130 135 140

Glu Cys Arg Gln Gln Gly Leu Tyr Glu Gln Ala Ala Gln His Phe Gly  
 145 150 155 160

Arg Ser Gln Ser Ala Leu Ala Asp His Gln Arg Phe Pro Glu Leu Ser  
 165 170 175

Arg Thr Leu His Gln Glu Gln Gly Gln Leu Arg Pro Tyr Arg Ile Leu  
 180 185 190

Glu Arg Leu Ala Gln Pro Leu Thr Ala Asp Ser Asp Arg Gln Gln Gly  
 195 200 205

Leu Leu Leu Leu Gln Ala Met Leu Asp Asp Arg Gln Gly Ile Glu Gly  
 210 215 220

Pro	Gly	Asp	Asp	Gly	Ser	Gly	Leu	Thr	Leu	Asp	Asn	Phe	Leu	Met	Phe	
225						230				235					240	
Leu	Gln	Gln	Ile	Arg	Gly	Tyr	Leu	Thr	Leu	Ala	Glu	Gln	Gln	Leu	Leu	
				245					250					255		
Phe	Glu	Ser	Glu	Ala	Arg	Arg	Pro	Ser	Pro	Ala	Ala	Ser	Phe	Phe	Ala	
			260					265					270			
Cys	Tyr	Thr	Leu	Ile	Ala	Arg	Gly	Phe	Cys	Asp	His	Gln	Pro	Ser	Leu	
		275					280					285				
Ile	His	Arg	Ala	Ser	Leu	Leu	Leu	His	Glu	Leu	Lys	Ser	Arg	Met	Asp	
		290					295				300					
Val	His	Ile	Glu	Gln	Ala	Ile	Ala	Ser	Leu	Leu	Leu	Gly	Gln	Pro	Glu	
305					310					315					320	
Glu	Ala	Glu	Ala	Leu	Leu	Val	Gln	Ser	Gln	Asp	Glu	Glu	Thr	Leu	Ser	
				325					330					335		
Gln	Ile	Arg	Ala	Leu	Ala	Gln	Gly	Glu	Ala	Leu	Ile	Val	Gly	Leu	Cys	
			340					345					350			
Arg	Phe	Thr	Glu	Thr	Trp	Leu	Ala	Thr	Lys	Val	Phe	Pro	Asp	Phe	Arg	
		355					360					365				
Asp	Leu	Lys	Glu	Arg	Thr	Ala	Pro	Leu	Gln	Pro	Tyr	Phe	Asp	Asp	Pro	
	370					375					380					
Asp	Val	Gln	Thr	Tyr	Leu	Asp	Ala	Ile	Val	Glu	Leu	Pro	Ser	Asp	Leu	
385					390					395					400	
Met	Pro	Thr	Pro	Leu	Pro	Val	Glu	Pro	Leu	Glu	Val	Arg	Ser	Ser	Leu	
				405					410					415		
Leu	Ala	Lys	Glu	Leu	Pro	Thr	Pro	Ala	Thr	Pro	Gly	Val	Ala	Pro	Pro	
			420					425					430			
Pro	Arg	Arg	Arg	Arg	Arg	Asp	Arg	Ser	Glu	Arg	Pro	Ala	Arg	Thr	Ala	
			435				440					445				
Lys	Arg	Leu	Pro	Leu	Pro	Trp	Ile	Gly	Leu	Gly	Val	Val	Val	Val	Leu	
	450					455					460					
Gly	Gly	Gly	Thr	Gly	Val	Trp	Ala	Trp	Arg	Ser	Arg	Ser	Asn	Ser	Thr	
465					470					475					480	

Pro Pro Thr Pro Pro Pro Val Val Gln Thr Leu Pro Glu Ala Val Pro  
485 490 495

Ala Pro Ser Pro Ala Pro Val Thr Val Ala Leu Asp Arg Ala Gln Ala  
500 505 510

Glu Thr Val Leu Gln Asn Trp Leu Ala Ala Lys Ala Ala Ala Leu Gly  
515 520 525

Pro Gln Tyr Asp Arg Asp Arg Leu Ala Thr Val Leu Thr Gly Glu Val  
530 535 540

Leu Gln Thr Trp Gln Gly Phe Ser Ser Gln Gln Ala Asn Thr Gln Leu  
545 550 555 560

Thr Ser Gln Phe Asp His Lys Leu Thr Val Asp Ser Val Gln Leu Ser  
565 570 575

Asp Gly Asp Gln Arg Ala Val Val Gln Ala Lys Val Asp Glu Val Glu  
580 585 590

Gln Val Tyr Arg Gly Asp Gln Leu Leu Glu Thr Arg Arg Asp Leu Gly  
595 600 605

Leu Val Ile Arg Tyr Gln Leu Val Arg Glu Asn Asn Ile Trp Lys Ile  
610 615 620

Ala Ser Ile Ser Leu Val Arg  
625 630

<210> 163  
<211> 2400  
<212> DNA  
<213> Anabaena PCC7120

<400> 163  
attatgttga tcacggtgca ggggaagtac gctgtgcgaa ttccgctaga ttactaccga 60  
attttagggc taccgttagc ggcaagtgat gaacaactgc gacaagcata cagcgatcgc 120  
attgtccaat tgccgcgacg ggagtattct caagcagcaa ttgcttcccg taaacaactt 180  
atagaagaag cttacgtggt tttatcagat ccaaaggaac gcagcagtta tgaccagctg 240  
tatcttgctc acgcctacga cccagacaac gcggctacaa ccaaagtggc agtggaaaat 300  
cgtggggaca gcaacaatgg tcatttcgat gtccaaagcc tgagcatcga agtttcctcc 360  
gaggaattaa ttggtgcttt attaattttg caagagttgg gagagtatga actcgtactc 420  
aagttagggtc gtaattactt aggtaatcaa aacggcacag catccaccag aaatggcaat 480



catcgcaegc	etgaagaatt	tctegatagt	tctgaaegtc	cagatattct	cttgactggt	540
gctttggcct	cattagaatt	agggcgggaa	caatggcaac	aaggccacta	tgaaaacgct	600
gctttgtctt	tagagactgg	gcaagaagtg	ctgttttagtg	aaggcatctt	cccagcgtc	660
caggcagaaa	ttcaggctga	tctttacaaa	ttacgccctt	atagaatttt	agaattactt	720
gccttaccct	aggaaaaaac	cattgaacgc	caccaagggc	tggatctatt	acaaagcatc	780
ttagacgatc	gcggtggcat	tgatggtaca	ggcaatgatc	aatcaggctt	aaacattgat	840
gacttcctcc	gattcatcca	gcaattacgc	caccacttaa	cagtggctga	acaacataag	900
ttgtttgatg	gtgaaagcaa	acgcccttcg	gctgtggcta	catacttagc	tgtttatgct	960
tccatcgcca	gaggattcac	ccaacgccag	cccgttttaa	ttcgtcatgc	caagcaaatt	1020
ctgatgcgtt	tgtctaagcg	gcaagatgtg	catttagagc	agtccctgtg	tgcgctatta	1080
ctagggcaaa	ctgaagaagc	cacgcgagtt	ttagaactga	gccaagaata	cgaagcttta	1140
gccttaattc	gagaaaaatc	tcaagattca	cccgatttac	tgccagggtt	gtgcttatat	1200
gccgaacaat	ggctgcaaaa	tgaagttttc	ccccatttcc	gcgatttgtc	cagacagcaa	1260
gcttccctga	aagattactt	tgctaataca	caagtacaag	cgtatttaga	agccttgccc	1320
aacgacgcgg	aaaccactaa	tgaatgggct	gtaattaacc	gccaatcggt	ttctcaacct	1380
aggggcaatt	cttactctgg	aggaacgcca	gtcgccaaac	gtcccgtagg	gaaggcgaac	1440
aggccaggag	aagcgtccac	aagaccagtt	ccccaacgta	gtcatccatc	agaagtaaatt	1500
cggcagtttc	atcaaaacag	aacctctgat	cccgaattac	cagaaacatc	aaaccacaga	1560
agaccagagt	cttcaaattt	tacaactgct	agagaaaata	tatcgaccac	agatgcttac	1620
actgacaatt	atccaccaga	gatccctgta	gaacgcgcca	gcagacctgt	tcagccgggg	1680
gtaagtgggt	atacccaatc	gacctctcca	cggcaaacct	ctaaacgcag	gagacgcaag	1740
aagccacagg	cagttgtcaa	cagaggacac	agtattcatc	agcaacgcca	acctcacct	1800
agcactctag	gccggaaaaac	aagattactt	tggatagttt	tgggttcttt	gggtgggata	1860
ttattgttct	ggctgatagt	ctcaacgact	tttgggtggt	taaagaatgt	attcttccca	1920
gcaccatctt	tacaagggtga	gcaattatcg	attcagatta	gtcaaccacc	tttagagatt	1980
ectgacaaaa	atgccagat	acaatcccca	gaggtgagtc	tcacagaaga	aacggcaagg	2040
aaaataattg	aaaattgggt	ggctacaaaa	getagtgtt	taggcgctga	acataaaaatt	2100
gagagtttta	acgagatttt	aactgggtca	gcgttatctc	aatggcgggt	aattgccttg	2160
caagataaag	cagacaatcg	tcacgagaa	tacagtcata	gtgtcaagggt	agactccatc	2220
agtaaactctg	acatagatcc	caatcgtgca	agtgtggggg	ctacagtcag	agagttaacc	2280
caattttatg	agaatgggca	aaaaggggaag	tcttctgacg	aaagattacg	tgtacgctat	2340

gaattgattc gacaagatga tattttggcgg attcagagga tgtcagccgc tataaattaa 2400

<210> 164  
 <211> 798  
 <212> PRT  
 <213> Anabaena PCC7120

<400> 164

Met Leu Ile Thr Val Gln Gly Lys Tyr Ala Val Arg Ile Pro Leu Asp  
 1 5 10 15

Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln Leu  
 20 25 30

Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu Tyr  
 35 40 45

Ser Gln Ala Ala Ile Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala Tyr  
 50 55 60

Val Val Leu Ser Asp Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu Tyr  
 65 70 75 80

Leu Ala His Ala Tyr Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala  
 85 90 95

Val Glu Asn Arg Gly Asp Ser Asn Asn Gly His Phe Asp Val Gln Ser  
 100 105 110

Leu Ser Ile Glu Val Ser Ser Glu Glu Leu Ile Gly Ala Leu Leu Ile  
 115 120 125

Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val Leu Lys Leu Gly Arg Asn  
 130 135 140

Tyr Leu Gly Asn Gln Asn Gly Thr Ala Ser Thr Arg Asn Gly Asn His  
 145 150 155 160

Arg Thr Pro Glu Glu Phe Leu Asp Ser Ser Glu Arg Pro Asp Ile Leu  
 165 170 175

Leu Thr Val Ala Leu Ala Ser Leu Glu Leu Gly Arg Glu Gln Trp Gln  
 180 185 190

Gln Gly His Tyr Glu Asn Ala Ala Leu Ser Leu Glu Thr Gly Gln Glu  
 195 200 205

Val Leu Phe Ser Glu Gly Ile Phe Pro Ser Val Gln Ala Glu Ile Gln  
 210 215 220

Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala  
 225 230 235 240

Leu Pro Gln Glu Lys Thr Ile Glu Arg His Gln Gly Leu Asp Leu Leu  
 245 250 255

Gln Ser Ile Leu Asp Asp Arg Gly Gly Ile Asp Gly Thr Gly Asn Asp  
 260 265 270

Gln Ser Gly Leu Asn Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln Leu  
 275 280 285

Arg His His Leu Thr Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu  
 290 295 300

Ser Lys Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser  
 305 310 315 320

Ile Ala Arg Gly Phe Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala  
 325 330 335

Lys Gln Ile Leu Met Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu  
 340 345 350

Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg  
 355 360 365

Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu  
 370 375 380

Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala  
 385 390 395 400

Glu Gln Trp Leu Gln Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser  
 405 410 415

Arg Gln Gln Ala Ser Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln  
 420 425 430

Ala Tyr Leu Glu Ala Leu Pro Asn Asp Ala Glu Thr Thr Asn Glu Trp  
 435 440 445

Ala Val Ile Asn Arg Gln Ser Phe Ser Gln Pro Arg Gly Asn Ser Tyr  
 450 455 460

Ser Gly Gly Thr Pro Val Ala Lys Arg Pro Val Gly Lys Ala Asn Arg  
 465 470 475 480

Pro Gly Glu Ala Ser Thr Arg Pro Val Pro Gln Arg Ser His Pro Ser  
 485 490 495

Glu Val Asn Arg Gln Phe His Gln Asn Arg Thr Pro Asp Pro Glu Leu  
 500 505 510

Pro Glu Thr Ser Asn His Arg Arg Pro Glu Ser Ser Asn Phe Thr Thr  
 515 520 525

Ala Arg Glu Asn Ile Ser Thr Thr Asp Ala Tyr Thr Asp Asn Tyr Pro  
 530 535 540

Pro Glu Ile Pro Val Glu Arg Ala Ser Arg Pro Val Gln Pro Gly Val  
 545 550 555 560

Ser Gly Tyr Thr Gln Ser Thr Pro Pro Arg Gln Thr Pro Lys Arg Arg  
 565 570 575

Arg Arg Lys Lys Pro Gln Ala Val Val Asn Arg Gly His Ser Ile His  
 580 585 590

Gln Gln Arg Gln Pro Ser Pro Ser Thr Leu Gly Arg Lys Thr Arg Leu  
 595 600 605

Leu Trp Ile Val Leu Gly Ser Leu Gly Gly Ile Leu Leu Phe Trp Leu  
 610 615 620

Ile Val Ser Thr Thr Phe Gly Trp Leu Lys Asn Val Phe Phe Pro Ala  
 625 630 635 640

Pro Ser Leu Gln Gly Glu Gln Leu Ser Ile Gln Ile Ser Gln Pro Pro  
 645 650 655

Leu Glu Ile Pro Asp Lys Asn Ala Gln Ile Gln Ser Pro Glu Val Ser  
 660 665 670

Leu Thr Glu Glu Thr Ala Arg Lys Ile Ile Glu Asn Trp Leu Ala Thr  
 675 680 685

Lys Ala Ser Ala Leu Gly Ala Glu His Lys Ile Glu Ser Leu Asn Glu  
 690 695 700

Ile Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Leu Gln

705		710		715		720
Asp Lys Ala Asp	Asn Arg His Arg Glu Tyr Ser His Ser Val Lys Val	725		730		735
Asp Ser Ile Ser	Lys Ser Asp Ile Asp Pro Asn Arg Ala Ser Val Gly	740		745		750
Ala Thr Val Arg	Glu Leu Thr Gln Phe Tyr Glu Asn Gly Gln Lys Gly	755		760		765
Lys Ser Ser Asp	Glu Arg Leu Arg Val Arg Tyr Glu Leu Ile Arg Gln	770		775		780
Asp Asp Ile Trp	Arg Ile Gln Arg Met Ser Ala Ala Ile Asn	785		790		795

<210> 165  
 <211> 798  
 <212> PRT  
 <213> Anabaena PCC7120  
 <400> 165

Met Leu Ile Thr	Val Gln Gly Lys Tyr Ala Val Arg Ile Pro Leu Asp	1	5	10	15
Tyr Tyr Arg Ile	Leu Gly Leu Pro Leu Ala Ala Ser Asp Glu Gln Leu	20	25	30	
Arg Gln Ala Tyr	Ser Asp Arg Ile Val Gln Leu Pro Arg Arg Glu Tyr	35	40	45	
Ser Gln Ala Ala	Ile Ala Ser Arg Lys Gln Leu Ile Glu Glu Ala Tyr	50	55	60	
Val Val Leu Ser	Asp Pro Lys Glu Arg Ser Ser Tyr Asp Gln Leu Tyr	65	70	75	80
Leu Ala His Ala	Tyr Asp Pro Asp Asn Ala Ala Thr Thr Lys Val Ala	85	90	95	
Val Glu Asn Arg	Gly Asp Ser Asn Asn Gly His Phe Asp Val Gln Ser	100	105	110	
Leu Ser Ile Glu	Val Ser Ser Glu Glu Leu Ile Gly Ala Leu Leu Ile	115	120	125	

Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val Leu Lys Leu Gly Arg Asn  
 130 135 140

Tyr Leu Gly Asn Gln Asn Gly Thr Ala Ser Thr Arg Asn Gly Asn His  
 145 150 155 160

Arg Thr Pro Glu Glu Phe Leu Asp Ser Ser Glu Arg Pro Asp Ile Leu  
 165 170 175

Leu Thr Val Ala Leu Ala Ser Leu Glu Leu Gly Arg Glu Gln Trp Gln  
 180 185 190

Gln Gly His Tyr Glu Asn Ala Ala Leu Ser Leu Glu Thr Gly Gln Glu  
 195 200 205

Val Leu Phe Ser Glu Gly Ile Phe Pro Ser Val Gln Ala Glu Ile Gln  
 210 215 220

Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala  
 225 230 235 240

Leu Pro Gln Glu Lys Thr Ile Glu Arg His Gln Gly Leu Asp Leu Leu  
 245 250 255

Gln Ser Ile Leu Asp Asp Arg Gly Gly Ile Asp Gly Thr Gly Asn Asp  
 260 265 270

Gln Ser Gly Leu Asn Ile Asp Asp Phe Leu Arg Phe Ile Gln Gln Leu  
 275 280 285

Arg His His Leu Thr Val Ala Glu Gln His Lys Leu Phe Asp Gly Glu  
 290 295 300

Ser Lys Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val Tyr Ala Ser  
 305 310 315 320

Ile Ala Arg Gly Phe Thr Gln Arg Gln Pro Ala Leu Ile Arg His Ala  
 325 330 335

Lys Gln Ile Leu Met Arg Leu Ser Lys Arg Gln Asp Val His Leu Glu  
 340 345 350

Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln Thr Glu Glu Ala Thr Arg  
 355 360 365

Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala Leu Ala Leu Ile Arg Glu  
 370 375 380

Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr Ala  
 385 390 395 400

Glu Gln Trp Leu Gln Asn Glu Val Phe Pro His Phe Arg Asp Leu Ser  
 405 410 415

Arg Gln Gln Ala Ser Leu Lys Asp Tyr Phe Ala Asn Gln Gln Val Gln  
 420 425 430

Ala Tyr Leu Glu Ala Leu Pro Asn Asp Ala Glu Thr Thr Asn Glu Trp  
 435 440 445

Ala Val Ile Asn Arg Gln Ser Phe Ser Gln Pro Arg Gly Asn Ser Tyr  
 450 455 460

Ser Gly Gly Thr Pro Val Ala Lys Arg Pro Val Gly Lys Ala Asn Arg  
 465 470 475 480

Pro Gly Glu Ala Ser Thr Arg Pro Val Pro Gln Arg Ser His Pro Ser  
 485 490 495

Glu Val Asn Arg Gln Phe His Gln Asn Arg Thr Pro Asp Pro Glu Leu  
 500 505 510

Pro Glu Thr Ser Asn His Arg Arg Pro Glu Ser Ser Asn Phe Thr Thr  
 515 520 525

Ala Arg Glu Asn Ile Ser Thr Thr Asp Ala Tyr Thr Asp Asn Tyr Pro  
 530 535 540

Pro Glu Ile Pro Val Glu Arg Ala Ser Arg Pro Val Gln Pro Gly Val  
 545 550 555 560

Ser Gly Tyr Thr Gln Ser Thr Pro Pro Arg Gln Thr Pro Lys Arg Arg  
 565 570 575

Arg Arg Lys Lys Pro Gln Ala Val Val Asn Arg Gly His Ser Ile His  
 580 585 590

Gln Gln Arg Gln Pro Ser Pro Ser Thr Leu Gly Arg Lys Thr Arg Leu  
 595 600 605

Leu Trp Ile Val Leu Gly Ser Leu Gly Gly Ile Leu Leu Phe Trp Leu  
 610 615 620

Ile Val Ser Thr Thr Phe Gly Trp Leu Lys Asn Val Phe Phe Pro Ala

625		630		635		640
Pro Ser Leu Gln Gly	Glu Gln Leu Ser Ile Gln Ile Ser Gln Pro Pro					
	645		650		655	
Leu Glu Ile Pro Asp Lys Asn Ala Gln Ile Gln Ser Pro Glu Val Ser						
	660		665		670	
Leu Thr Glu Glu Thr Ala Arg Lys Ile Ile Glu Asn Trp Leu Ala Thr						
	675		680		685	
Lys Ala Ser Ala Leu Gly Ala Glu His Lys Ile Glu Ser Leu Asn Glu						
	690		695		700	
Ile Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Leu Gln						
705		710		715		720
Asp Lys Ala Asp Asn Arg His Arg Glu Tyr Ser His Ser Val Lys Val						
	725		730		735	
Asp Ser Ile Ser Lys Ser Asp Ile Asp Pro Asn Arg Ala Ser Val Gly						
	740		745		750	
Ala Thr Val Arg Glu Leu Thr Gln Phe Tyr Glu Asn Gly Gln Lys Gly						
	755		760		765	
Lys Ser Ser Asp Glu Arg Leu Arg Val Arg Tyr Glu Leu Ile Arg Gln						
	770		775		780	
Asp Asp Ile Trp Arg Ile Gln Arg Met Ser Ala Ala Ile Asn						
785		790		795		

<210> 166  
 <211> 2307  
 <212> DNA  
 <213> Nostoc punctiforme

<400> 166	
gtgcgaattc cgctagatta ctaccgaatt ttaggactac cgcttagcggc aagtgaagaa	60
caattgcgac aggcatagac cgatcgcat gtacaattgc cagcagtgga gtattctcag	120
gcagcaatttt cttctcgtaa acaactcata gaagaagctt acgtgggtttt atcagatcca	180
aaacaacgca gtacctacga tcagctttat cttgcccacg cctatgaccc tgataacctt	240
gctgctgccg cagtagcaca ggaaaatcgt acagaaagca ccaaaagggg tagtgatacc	300
cagagtcttg gtatagaaat tacccaagac gaattagttg gcgctttatt aattttgcaa	360
gagttgggtg aatacgaact tgtattgaaa ctaggctcgtc cgtacctagt aaataaaaat	420



agtgctacaa gttcaagaaa aagcaataac ttagcagatg aagaaattta tgaaagtgct	480
gaacacccag atgtcgttct cactgttgct cttgcctgtc tagaattagg tgcggaacag	540
tggcagcaag gtcactacga aaatgccgcc atatccctag aaactgggtca agagctgcta	600
gtacgtgaag gtttgttctc cagtatccag gcagaaattc aggctgatct ttacaaattg	660
cggccatata gaatttttga gttgctcgca ttacctcaag aaaagactgc cgaacgaagc	720
caaggcttag aattattgca aaatctctta gaagatcgtg gcgggattga tggcacgaac	780
aatgatgaat cgggttttaa catagatgac tttctgcgat ttatccagca gttacgcaac	840
cacttaacag ttgcagaaca gcacaagtta tttgaagctc aaagcaaacg ttcttctgct	900
gttgccactt acttagctgt ttatgccttg atagcgcgag gatttgctca acggcaacct	960
gctttaattc gtcaagcaag acaaatgctc gtgcgtctgg gcaagcgcca agatgtacat	1020
----- ttagaacagt cgctatgtgc cttacttttg gggcaaaactg aagaagcaac tcgtgtttta -----	1080
gaacttagtc aggagtacga agcttttagct tttattcggg aaaaatctca ggactctcca	1140
gatttggttac cgggtctgtg tttatatgca gaacagtggc tgcaacacga agtctttccc	1200
cattttcgag atttagcaaa ccagcaagct ttcctaaaag attactttgc taaccaacag	1260
gtgcaagctt atttagaagc actgccaaact gatgccccaa caactaatga atgggctgta	1320
attaaccccc agtattttcc ccaggccaag gcaaagaata ctcattttca taacaattca	1380
actaaaactt cagcgtcatt taatcacagc agagtaccta acccagattt gccagaaaca	1440
ccaacaaaag aaacctctga atatccaaac ttctcaccac ctatgtggag ttcattctgga	1500
agtataaaat cagaggttcc tgctgctgaa aggatgagca gaggtactaa tcagcatttg	1560
aacggttcag ctaagagtgc tgcattctgg cataaccaa agcgtaggcg gagaaaacct	1620
actccatctg ctagccgaga gcgtatacca gataatcgtc ctcatctctg tcgtccccga	1680
aggcggcgaa cttttgcgaa caccatagaa ggtaaaacac ggctgggtatg gagagtgttt	1740
atttcttttg tgagcatatt agtttttttg gtattagcca caacaacttt tggatggtta	1800
aaaaatctgt tttttcctca accttctccg cctgatctac agttgtttgt acaaataaac	1860
caaccaccgt tacctattcc cgatccaaat agaaaaccag aatcagaaga aggcccttta	1920
acaaatgcag aggcagaaga agttattcac acttggttat ctaccaaagc cgcagcttta	1980
gggccaatc atgagattaa taatttagag caaattttta ctggttcagc tttatctcaa	2040
tggcgactga ttgctcaaca gaataagtta gacaatcgct accgcaagtt cgaccatagt	2100
ttgaagatag aatctgttga gaaaattggg ttatttgtag atcgtgccgc agtagaagct	2160
acggtcaaag aagtgacgca gttatatgaa aataatcagt ttaaaaactc ttctaacgat	2220
aaattaagag ttcggtatga cttgattcga gaacgaggta aatggcgtat tcagagtaca	2280

tctgttgtaa atcaattcac cagataa

2307

<210> 167

<211> 768

<212> PRT

<213> Nostoc punctiforme

<400> 167

Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Leu Ala  
1 5 10 15

Ala Ser Glu Glu Gln Leu Arg Gln Ala Tyr Ser Asp Arg Ile Val Gln  
20 25 30

Leu Pro Arg Arg Glu Tyr Ser Gln Ala Ala Ile Ser Ser Arg Lys Gln  
35 40 45

Leu Ile Glu Glu Ala Tyr Val Val Leu Ser Asp Pro Lys Gln Arg Ser  
50 55 60

Thr Tyr Asp Gln Leu Tyr Leu Ala His Ala Tyr Asp Pro Asp Asn Leu  
65 70 75 80

Ala Ala Ala Ala Val Ala Gln Glu Asn Arg Thr Glu Ser Thr Lys Arg  
85 90 95

Gly Ser Asp Thr Gln Ser Leu Gly Ile Glu Ile Thr Gln Asp Glu Leu  
100 105 110

Val Gly Ala Leu Leu Ile Leu Gln Glu Leu Gly Glu Tyr Glu Leu Val  
115 120 125

Leu Lys Leu Gly Arg Pro Tyr Leu Val Asn Lys Asn Ser Ala Thr Ser  
130 135 140

Ser Arg Lys Ser Asn Asn Leu Ala Asp Glu Glu Ile Tyr Glu Ser Ala  
145 150 155 160

Glu His Pro Asp Val Val Leu Thr Val Ala Leu Ala Cys Leu Glu Leu  
165 170 175

Gly Arg Glu Gln Trp Gln Gln Gly His Tyr Glu Asn Ala Ala Ile Ser  
180 185 190

Leu Glu Thr Gly Gln Glu Leu Leu Val Arg Glu Gly Leu Phe Ser Ser  
195 200 205

Ile Gln Ala Glu Ile Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg  
 210 215 220  
 Ile Leu Glu Leu Leu Ala Leu Pro Gln Glu Lys Thr Ala Glu Arg Ser  
 225 230 235 240  
 Gln Gly Leu Glu Leu Leu Gln Asn Leu Leu Glu Asp Arg Gly Gly Ile  
 245 250 255  
 Asp Gly Thr Asn Asn Asp Glu Ser Gly Leu Asn Ile Asp Asp Phe Leu  
 260 265 270  
 Arg Phe Ile Gln Gln Leu Arg Asn His Leu Thr Val Ala Glu Gln His  
 275 280 285  
 Lys Leu Phe Glu Ala Gln Ser Lys Arg Ser Ser Ala Val Ala Thr Tyr  
 290 295 300  
 Leu Ala Val Tyr Ala Leu Ile Ala Arg Gly Phe Ala Gln Arg Gln Pro  
 305 310 315 320  
 Ala Leu Ile Arg Gln Ala Arg Gln Met Leu Val Arg Leu Gly Lys Arg  
 325 330 335  
 Gln Asp Val His Leu Glu Gln Ser Leu Cys Ala Leu Leu Leu Gly Gln  
 340 345 350  
 Thr Glu Glu Ala Thr Arg Val Leu Glu Leu Ser Gln Glu Tyr Glu Ala  
 355 360 365  
 Leu Ala Phe Ile Arg Glu Lys Ser Gln Asp Ser Pro Asp Leu Leu Pro  
 370 375 380  
 Gly Leu Cys Leu Tyr Ala Glu Gln Trp Leu Gln His Glu Val Phe Pro  
 385 390 395 400  
 His Phe Arg Asp Leu Ala Asn Gln Gln Ala Phe Leu Lys Asp Tyr Phe  
 405 410 415  
 Ala Asn Gln Gln Val Gln Ala Tyr Leu Glu Ala Leu Pro Thr Asp Ala  
 420 425 430  
 Gln Thr Thr Asn Glu Trp Ala Val Ile Asn Pro Gln Tyr Phe Pro Gln  
 435 440 445  
 Ala Lys Ala Lys Asn Thr His Phe His Asn Asn Ser Thr Lys Thr Ser  
 450 455 460

Ala Ser Phe Asn His Ser Arg Val Pro Asn Pro Asp Leu Pro Glu Thr  
465 470 475 480

Pro Thr Lys Glu Thr Ser Glu Tyr Pro Asn Phe Ser Pro Pro Met Trp  
485 490 495

Ser Ser Ser Gly Ser Ile Lys Ser Glu Val Pro Ala Ala Glu Arg Met  
500 505 510

Ser Arg Gly Thr Asn Gln His Leu Asn Gly Ser Ala Lys Ser Ala Ala  
515 520 525

Ser Gly His Asn Gln Lys Arg Arg Arg Arg Lys Pro Thr Pro Ser Ala  
530 535 540

Ser Arg Glu Arg Ile Pro Asp Asn Arg Pro His Ser Arg Arg Pro Arg  
545 550 555 560

Arg Arg Arg Thr Phe Ala Asn Thr Ile Glu Gly Lys Thr Arg Leu Val  
565 570 575

Trp Arg Val Phe Ile Ser Leu Val Ser Ile Leu Val Phe Trp Val Leu  
580 585 590

Ala Thr Thr Thr Phe Gly Trp Leu Lys Asn Leu Phe Phe Pro Gln Pro  
595 600 605

Ser Pro Pro Asp Leu Gln Leu Phe Val Gln Ile Asn Gln Pro Pro Leu  
610 615 620

Pro Ile Pro Asp Pro Asn Arg Lys Pro Glu Ser Glu Glu Gly Pro Leu  
625 630 635 640

Thr Asn Ala Glu Ala Glu Glu Val Ile His Thr Trp Leu Ser Thr Lys  
645 650 655

Ala Ala Ala Leu Gly Pro Asn His Glu Ile Asn Asn Leu Glu Gln Ile  
660 665 670

Leu Thr Gly Ser Ala Leu Ser Gln Trp Arg Leu Ile Ala Gln Gln Asn  
675 680 685

Lys Leu Asp Asn Arg Tyr Arg Lys Phe Asp His Ser Leu Lys Ile Glu  
690 695 700

Ser Val Glu Lys Ile Gly Leu Phe Ala Asp Arg Ala Ala Val Glu Ala

705

710

715

720

Thr Val Lys Glu Val Thr Gln Leu Tyr Glu Asn Asn Gln Phe Lys Asn  
 725 730 735

Ser Ser Asn Asp Lys Leu Arg Val Arg Tyr Asp Leu Ile Arg Glu Arg  
 740 745 750

Gly Lys Trp Arg Ile Gln Ser Thr Ser Val Val Asn Gln Phe Thr Arg  
 755 760 765

&lt;210&gt; 168

&lt;211&gt; 2145

&lt;212&gt; DNA

&lt;213&gt; Synechocystis PCC6803

&lt;400&gt; 168

```

gtgtttatcc ccctcgactt ttatcgatatt ttaggcattc ctcccagag tgggtggggaa      60
accattgagc aggcctacca agatcgctt ttacaattac cccggcgaga atttagtgac      120
gccgcagtta ctctccgcaa tcaattactg gcgatcgctt atgaaaccct gagggatccg      180
gaaaaacgtc aggcatacga ccaagaatgg tggggagcca tggatgaagc cctgggggag      240
gccttaccctt tcaactaccct ggagttggaa tgtagcccag agcaagaaat tggagccctg      300
ttgatcctgt tggatttggg ggaatacga ctcgtgggta agtatggtga gccagtactc      360
cacgatccca accctccggc gggaggcctg cccagaggact atttgctttc ggtaattttg      420
gcccactggg aactgagccg ggaacgttgg caacaacagc agtatgaatt tgccgccacc      480
gccagtctta aggccttagc tcggttgcaa caggataatg acttccccgc cttggaagca      540
gaaattcgtc aggaactata ccgtctgcga ccctaccgta tcctcgaact tttggctaag      600
gaggggcaag gggaggagca acgtcagcag ggtctagctc tgttgcaagc gatggtgcag      660
gaccggggcg gcattgaagg taagggggaa gattattccg gattgggaaa tgatgacttt      720
ctaaaattca tccaccaact acgtgtgcac ctcacagtgg ccgagcaaaa cgcctatttt      780
ttgcccgaag gtcaacggcc atcttttagta gcaagctatt tggcagtaca tagtctgatg      840
gctgaggggag tgaaggaaca ggaccccatg gccattgtcg aagcaaaatc tttgattata      900
cagttggaaa attgtcaaga tttggcccta gaaaaggtaa tttgtgaatt attattgggt      960
caaacggaag ttgttctggc ggcatcgac caggagagatc cgaaaatagt agctggcctc     1020
gaatctaagt tagcgacggg ggaagacccc ttaactgctt tttatacttt cactgagcag     1080
tggctagagg aagaaattgt cccctacttt agggatcttt ctccggagac cctttccccc     1140
aaggcctatt tcaataatcc ctccgttcag cagtatctag aacaactaga gccggattcc     1200
ttcaccactg acaattcttt tgcctcccct gccctcctta gcaccgcaac ggaatcgga      1260

```

actcccatgg tacatagtgc cgccgeectt cccgatcgcc ctttgacctc caccgttccc 1320  
 tcacgacggg gacgcagtcc aagacgttcc cgagacgatg ttttccccag cgccgacaat 1380  
 tccagtgggt tggccgtcac caccctatct ccggcgatcg cctacgacac ccactccttg 1440  
 ggcaccaacg gtattggcgg ggatagcact agcaacgggt tttccagtaa ctccgcccc 1500  
 gaatccacca gtaaacataa atctccccgg cgacgcaaaa aacgggtgac catcaagccg 1560  
 gtgcgcttcg gcatttttct gctttgccta gcaggcattg tggggggggc aactgcccta 1620  
 attatcaatc gtactggcga tcccctaggt ggggttgctag aagaccccct agatgttttc 1680  
 ctggaccaac cttcagaatt tatccccgat gaagccacga gccggaattt gattctcagt 1740  
 caacccaact tcaatcagca agtgggtcag atggtagtac aaggctggct tgatagtaaa 1800  
 aagttagcct ttggccaaaa ctacgatgtc ggggcattgc agagtgtttt agcccccaat 1860  
 ctcccttgccc aacaacgggg tcgggcccac cgggatcaag cccaaaagggt ctatcaccaa 1920  
 tacgaacaca agttgcagat tttagcctat caagttaacc cccaagacc caaccgagcc 1980  
 accgttactg cccgggtaga agaaattagc cagcccttta ccctaggtaa tcaacagcag 2040  
 aagggtccg ccaccaaaga tgacttgact gtgcgctatc agctagtacg acaccaaggg 2100  
 gtttgaaaaa ttgaccaa atacaagtggta aatggcccc gttag 2145

<210> 169  
 <211> 714  
 <212> PRT  
 <213> Synechocystis PCC6803

<400> 169

Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln  
 1 5 10 15

Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln  
 20 25 30

Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln  
 35 40 45

Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln  
 50 55 60

Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu  
 65 70 75 80

Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu  
 85 90 95

Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val  
100 105 110

Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly  
115 120 125

Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu  
130 135 140

Leu Ser Arg Glu Arg Trp Gln Gln Gln Gln Tyr Glu Phe Ala Ala Thr  
145 150 155 160

Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro  
165 170 175

Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr  
180 185 190

Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg  
195 200 205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly  
210 215 220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe  
225 230 235 240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln  
245 250 255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser  
260 265 270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp  
275 280 285

Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn  
290 295 300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Leu Gly  
305 310 315 320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile  
325 330 335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr  
340 345 350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Glu Ile Val Pro  
355 360 365

Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe  
370 375 380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser  
385 390 395 400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala  
405 410 415

Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp  
420 425 430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg  
435 440 445

Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu  
450 455 460

Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu  
465 470 475 480

Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser  
485 490 495

Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg  
500 505 510

Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu  
515 520 525

Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg  
530 535 540

Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe  
545 550 555 560

Leu Asp Gln Pro Ser Glu Phe Ile Pro Asp Glu Ala Thr Ser Arg Asn  
565 570 575

Leu Ile Leu Ser Gln Pro Asn Phe Asn Gln Gln Val Gly Gln Met Val  
580 585 590

Val Gln Gly Trp Leu Asp Ser Lys Lys Leu Ala Phe Gly Gln Asn Tyr



595	600	605
Asp Val Gly Ala Leu Gln Ser Val Leu Ala Pro Asn Leu Leu Ala Gln 610 615 620		
Gln Arg Gly Arg Ala Gln Arg Asp Gln Ala Gln Lys Val Tyr His Gln 625 630 635 640		
Tyr Glu His Lys Leu Gln Ile Leu Ala Tyr Gln Val Asn Pro Gln Asp 645 650 655		
Pro Asn Arg Ala Thr Val Thr Ala Arg Val Glu Glu Ile Ser Gln Pro 660 665 670		
Phe Thr Leu Gly Asn Gln Gln Gln Lys Gly Ser Ala Thr Lys Asp Asp 675 680 685		
Leu Thr Val Arg Tyr Gln Leu Val Arg His Gln Gly Val Trp Lys Ile 690 695 700		
Asp Gln Ile Gln Val Val Asn Gly Pro Arg 705 710		
<210> 170		
<211> 714		
<212> PRT		
<213> Synechocystis PCC6803		
<400> 170		
Met Phe Ile Pro Leu Asp Phe Tyr Arg Ile Leu Gly Ile Pro Pro Gln 1 5 10 15		
Ser Gly Gly Glu Thr Ile Glu Gln Ala Tyr Gln Asp Arg Leu Leu Gln 20 25 30		
Leu Pro Arg Arg Glu Phe Ser Asp Ala Ala Val Thr Leu Arg Asn Gln 35 40 45		
Leu Leu Ala Ile Ala Tyr Glu Thr Leu Arg Asp Pro Glu Lys Arg Gln 50 55 60		
Ala Tyr Asp Gln Glu Trp Trp Gly Ala Met Asp Glu Ala Leu Gly Glu 65 70 75 80		
Ala Leu Pro Leu Thr Thr Pro Glu Leu Glu Cys Ser Pro Glu Gln Glu 85 90 95		

Ile Gly Ala Leu Leu Ile Leu Leu Asp Leu Gly Glu Tyr Glu Leu Val  
100 105 110

Val Lys Tyr Gly Glu Pro Val Leu His Asp Pro Asn Pro Pro Ala Gly  
115 120 125

Gly Leu Pro Gln Asp Tyr Leu Leu Ser Val Ile Leu Ala His Trp Glu  
130 135 140

Leu Ser Arg Glu Arg Trp Gln Gln Gln Gln Tyr Glu Phe Ala Ala Thr  
145 150 155 160

Ala Ser Leu Lys Ala Leu Ala Arg Leu Gln Gln Asp Asn Asp Phe Pro  
165 170 175

Ala Leu Glu Ala Glu Ile Arg Gln Glu Leu Tyr Arg Leu Arg Pro Tyr  
180 185 190

Arg Ile Leu Glu Leu Leu Ala Lys Glu Gly Gln Gly Glu Glu Gln Arg  
195 200 205

Gln Gln Gly Leu Ala Leu Leu Gln Ala Met Val Gln Asp Arg Gly Gly  
210 215 220

Ile Glu Gly Lys Gly Glu Asp Tyr Ser Gly Leu Gly Asn Asp Asp Phe  
225 230 235 240

Leu Lys Phe Ile His Gln Leu Arg Cys His Leu Thr Val Ala Glu Gln  
245 250 255

Asn Ala Leu Phe Leu Pro Glu Ser Gln Arg Pro Ser Leu Val Ala Ser  
260 265 270

Tyr Leu Ala Val His Ser Leu Met Ala Glu Gly Val Lys Glu Gln Asp  
275 280 285

Pro Met Ala Ile Val Glu Ala Lys Ser Leu Ile Ile Gln Leu Glu Asn  
290 295 300

Cys Gln Asp Leu Ala Leu Glu Lys Val Ile Cys Glu Leu Leu Leu Gly  
305 310 315 320

Gln Thr Glu Val Val Leu Ala Ala Ile Asp Gln Gly Asp Pro Lys Ile  
325 330 335

Val Ala Gly Leu Glu Ser Lys Leu Ala Thr Gly Glu Asp Pro Leu Thr  
340 345 350

Ala Phe Tyr Thr Phe Thr Glu Gln Trp Leu Glu Glu Glu Ile Val Pro  
355 360 365

Tyr Phe Arg Asp Leu Ser Pro Glu Thr Leu Ser Pro Lys Ala Tyr Phe  
370 375 380

Asn Asn Pro Ser Val Gln Gln Tyr Leu Glu Gln Leu Glu Pro Asp Ser  
385 390 395 400

Phe Thr Thr Asp Asn Ser Phe Ala Ser Pro Ala Leu Leu Ser Thr Ala  
405 410 415

Thr Glu Ser Glu Thr Pro Met Val His Ser Ser Ala Ala Leu Pro Asp  
420 425 430

Arg Pro Leu Thr Ser Thr Val Pro Ser Arg Arg Gly Arg Ser Pro Arg  
435 440 445

Arg Ser Arg Asp Asp Val Phe Pro Ser Ala Asp Asn Ser Ser Gly Leu  
450 455 460

Ala Val Thr Thr Leu Ser Pro Ala Ile Ala Tyr Asp Thr His Ser Leu  
465 470 475 480

Gly Thr Asn Gly Ile Gly Gly Asp Ser Thr Ser Asn Gly Phe Ser Ser  
485 490 495

Asn Ser Ala Pro Glu Ser Thr Ser Lys His Lys Ser Pro Arg Arg Arg  
500 505 510

Lys Lys Arg Val Thr Ile Lys Pro Val Arg Phe Gly Ile Phe Leu Leu  
515 520 525

Cys Leu Ala Gly Ile Val Gly Gly Ala Thr Ala Leu Ile Ile Asn Arg  
530 535 540

Thr Gly Asp Pro Leu Gly Gly Leu Leu Glu Asp Pro Leu Asp Val Phe  
545 550 555 560

Leu Asp Gln Pro Ser Glu Phe Ile Pro Asp Glu Ala Thr Ser Arg Asn  
565 570 575

Leu Ile Leu Ser Gln Pro Asn Phe Asn Gln Gln Val Gly Gln Met Val  
580 585 590

Val Gln Gly Trp Leu Asp Ser Lys Lys Leu Ala Phe Gly Gln Asn Tyr

595

600

605

Asp Val Gly Ala Leu Gln Ser Val Leu Ala Pro Asn Leu Leu Ala Gln  
610 615 620

Gln Arg Gly Arg Ala Gln Arg Asp Gln Ala Gln Lys Val Tyr His Gln  
625 630 635 640

Tyr Glu His Lys Leu Gln Ile Leu Ala Tyr Gln Val Asn Pro Gln Asp  
645 650 655

Pro Asn Arg Ala Thr Val Thr Ala Arg Val Glu Glu Ile Ser Gln Pro  
660 665 670

Phe Thr Leu Gly Asn Gln Gln Gln Lys Gly Ser Ala Thr Lys Asp Asp  
675 680 685

Leu Thr Val Arg Tyr Gln Leu Val Arg His Gln Gly Val Trp Lys Ile  
690 695 700

Asp Gln Ile Gln Val Val Asn Gly Pro Arg  
705 710

<210> 171

<211> 819

<212> PRT

<213> Arabidopsis thaliana

<400> 171

Met Pro Val Ala Tyr Thr Phe Pro Val Leu Pro Ser Ser Cys Leu Leu  
1 5 10 15

Cys Gly Ile Ser Asn Arg Ser Thr Ser Phe Val Val Asp Arg Pro Glu  
20 25 30

Leu Gln Ile Ser Gly Leu Leu Val Val Arg Ser Glu Ser Gly Glu Phe  
35 40 45

Phe Gly Ser Gly Leu Ser Leu Arg Arg Phe Gln Arg Glu Gly Arg Arg  
50 55 60

Arg Leu Asn Ala Ala Gly Gly Gly Ile His Val Val Asp Asn Ala Pro  
65 70 75 80

Ser Arg Thr Ser Ser Leu Ala Ala Ser Thr Ser Thr Ile Glu Leu Pro  
85 90 95

Val Thr Cys Tyr Gln Leu Ile Gly Val Ser Glu Gln Ala Glu Lys Asp  
100 105 110

Glu Val Val Lys Ser Val Ile Asn Leu Lys Lys Thr Asp Ala Glu Glu  
115 120 125

Gly Tyr Thr Met Glu Ala Ala Ala Arg Gln Asp Leu Leu Met Asp  
130 135 140

Val Arg Asp Lys Leu Leu Phe Glu Ser Glu Tyr Ala Gly Asn Leu Lys  
145 150 155 160

Glu Lys Ile Ala Pro Lys Ser Pro Leu Arg Ile Pro Trp Ala Trp Leu  
165 170 175

Pro Gly Ala Leu Cys Leu Leu Gln Glu Val Gly Gln Glu Lys Leu Val  
180 185 190

Leu Asp Ile Gly Arg Ala Ala Leu Arg Asn Leu Asp Ser Lys Pro Tyr  
195 200 205

Ile His Asp Ile Phe Leu Ser Met Ala Leu Ala Glu Cys Ala Ile Ala  
210 215 220

Lys Ala Ala Phe Glu Val Asn Lys Val Ser Gln Gly Phe Glu Ala Leu  
225 230 235 240

Ala Arg Ala Gln Ser Phe Leu Lys Ser Lys Val Thr Leu Gly Lys Leu  
245 250 255

Ala Leu Leu Thr Gln Ile Glu Glu Ser Leu Glu Gly Leu Ala Pro Pro  
260 265 270

Cys Thr Leu Asp Leu Leu Gly Leu Pro Arg Thr Pro Glu Asn Ala Glu  
275 280 285

Arg Arg Arg Gly Ala Ile Ala Ala Leu Arg Glu Leu Leu Arg Gln Gly  
290 295 300

Leu Ser Val Glu Ala Ser Cys Gln Ile Gln Asp Trp Pro Cys Phe Leu  
305 310 315 320

Ser Gln Ala Ile Ser Arg Leu Leu Ala Thr Glu Ile Val Asp Leu Leu  
325 330 335

Pro Trp Asp Asp Leu Ala Ile Thr Arg Lys Asn Lys Lys Ser Leu Glu  
340 345 350

Ser His Asn Gln Arg Val Val Ile Asp Phe Asn Cys Phe Tyr Met Val  
355 360 365

Leu Leu Gly His Ile Ala Val Gly Phe Ser Gly Lys Gln Asn Glu Thr  
370 375 380

Ile Asn Lys Ala Lys Thr Ile Cys Glu Cys Leu Ile Ala Ser Glu Gly  
385 390 395 400

Val Asp Leu Lys Phe Glu Glu Ala Phe Cys Ser Phe Leu Leu Lys Gln  
405 410 415

Gly Ser Glu Ala Glu Ala Leu Glu Lys Leu Lys Gln Leu Glu Ser Asn  
420 425 430

Ser Asp Ser Ala Val Arg Asn Ser Ile Leu Gly Lys Glu Ser Arg Ser  
435 440 445

Thr Ser Ala Thr Pro Ser Leu Glu Ala Trp Leu Met Glu Ser Val Leu  
450 455 460

Ala Asn Phe Pro Asp Thr Arg Gly Cys Ser Pro Ser Leu Ala Asn Phe  
465 470 475 480

Phe Arg Ala Glu Lys Lys Tyr Pro Glu Asn Lys Lys Met Gly Ser Pro  
485 490 495

Ser Ile Met Asn His Lys Thr Asn Gln Arg Pro Leu Ser Thr Thr Gln  
500 505 510

Phe Val Asn Ser Ser Gln His Leu Tyr Thr Ala Val Glu Gln Leu Thr  
515 520 525

Pro Thr Asp Leu Gln Ser Pro Val Val Ser Ala Lys Asn Asn Asp Glu  
530 535 540

Thr Ser Ala Ser Met Pro Ser Val Gln Leu Lys Arg Asn Leu Gly Val  
545 550 555 560

His Lys Asn Lys Ile Trp Asp Glu Trp Leu Ser Gln Ser Ser Leu Ile  
565 570 575

Gly Arg Val Ser Val Val Ala Leu Leu Gly Cys Thr Val Phe Phe Ser  
580 585 590

Leu Lys Leu Ser Gly Ile Arg Ser Gly Arg Leu Gln Ser Met Pro Ile

595

600

605

Ser Val Ser Ala Arg Pro His Ser Glu Ser Asp Ser Phe Leu Trp Lys  
610 615 620

Thr Glu Ser Gly Asn Phe Arg Lys Asn Leu Asp Ser Val Asn Arg Asn  
625 630 635 640

Gly Ile Val Gly Asn Ile Lys Val Leu Ile Asp Met Leu Lys Met His  
645 650 655

Cys Gly Glu His Pro Asp Ala Leu Tyr Leu Lys Ser Ser Gly Gln Ser  
660 665 670

Ala Thr Ser Leu Ser His Ser Ala Ser Glu Leu His Lys Arg Pro Met  
675 680 685

Asp Thr Glu Glu Ala Glu Glu Leu Val Arg Gln Trp Glu Asn Val Lys  
690 695 700

Ala Glu Ala Leu Gly Pro Thr His Gln Val Tyr Ser Leu Ser Glu Val  
705 710 715 720

Leu Asp Glu Ser Met Leu Val Gln Trp Gln Thr Leu Ala Gln Thr Ala  
725 730 735

Glu Ala Lys Ser Cys Tyr Trp Arg Phe Val Leu Leu His Leu Glu Val  
740 745 750

Leu Gln Ala His Ile Phe Glu Asp Gly Ile Ala Gly Glu Ala Ala Glu  
755 760 765

Ile Glu Ala Leu Leu Glu Glu Ala Ala Glu Leu Val Asp Glu Ser Gln  
770 775 780

Pro Lys Asn Ala Lys Tyr Tyr Ser Thr Tyr Lys Ile Arg Tyr Ile Leu  
785 790 795 800

Lys Lys Gln Glu Asp Gly Leu Trp Lys Phe Cys Gln Ser Asp Ile Gln  
805 810 815

Ile Gln Lys

<210> 172  
<211> 2857  
<212> DNA

<213> *Arabidopsis thaliana*

<400> 172

actgtcaaaa	ctcaaaagcc	ttgagaccaa	atttccgatt	ttttctcctc	tgaagaaatc	60
caacaaattg	taccatgatt	ccagcttcac	tctacttctt	ctaggggttcg	ttcgttttct	120
ggagctgttg	cgcaatgcc	gtagcttaca	catttccagt	tctcccttct	tcttgtctgc	180
tttgcggaat	ctccaatcgc	agcaccagct	tcgtcgtaga	tcgcccggag	cttcagatct	240
cagggtctcct	cgtcgttcgt	tctgaatccg	gtgaattcct	cggttctggg	ttatctttgc	300
ggcggtttca	gcgagaagga	cggaggaggt	tgaatgctgc	tggtgggtgg	atccatgtcg	360
tcgacaatgc	gccgtctcgt	acttcttctc	tcgtgcac	tacctctaca	atcgaactcc	420
cggttacgtg	ttaccagctt	atcggagttt	ctgagcaagc	tgagaaaagac	gaggtcgtta	480
agtcggttat	aaatttgaaa	aaaactgatg	ctgaagaggg	ttatacaatg	gaagctgctg	540
cagctcgcca	ggatcttctc	atggatgtta	gggataaact	tctttttgaa	tcagaatatg	600
ctggtaacct	aaaagaaaaag	attgctccta	aatctcctct	cagaattccg	tgggcatggg	660
tgccctgggtgc	tctatgcctt	cttcaagagg	ttggacaaga	aaaacttgtg	ctggatattg	720
gccgggctgc	tctcaggaac	cttgattcaa	agccatatat	tcatgatata	ttcttatcta	780
tggcacttgc	tgagtgtgca	attgccaagg	ctgctttcga	ggttaacaag	gtctctcaag	840
gatttgaagc	tcttgctcgt	gctcaaagtt	ttctgaagag	taaagttact	cttgggaaac	900
ttgcattggt	aactcagatt	gaggagtcac	tagaggggct	tgcaccacct	tgcacattgg	960
atctactggg	cctgccacgc	acgccagaaa	atgcagagag	gaggcgaggt	gcaattgccg	1020
cgctacgcga	actgctcaga	cagggcctta	gtgttgaagc	ttcatgtcaa	attcaagact	1080
ggccatgctt	tttgagccag	gcaattagca	ggttattggc	cacagagatt	gtcgatcttc	1140
ttccatggga	tgatttagcc	attacacgga	aaaataaaaa	atcactggaa	tcccacaatc	1200
aaagagtgtg	tattgatttt	aattgtttct	acatgggtgt	acttgggtcac	atcgctgttg	1260
gattttcagg	caagcaaaat	gaaacgatta	ataaagcaaa	aacgatatgc	gaatgtctca	1320
tagcatcaga	aggtgttgat	ctgaaatttg	aggaagcttt	ttgctcattt	cttctaaaaac	1380
agggttccga	ggcagaggcc	ctggaaaaac	ttaagcagct	ggaatcaaat	tcagactctg	1440
ccgttcgtaa	ttcgatcttg	gggaaagagt	cgagaagtac	ttctgctact	ccctcactgg	1500
aagcgtgggt	aatggagtcc	gtgcttgcta	actttccaga	cacaaggggt	tggtctccat	1560
ctttggccaa	ttttttccgg	gctgaaaaga	aatatccaga	aaacaagaaa	atgggggtcac	1620
cttcgatcat	gaatcataag	acgaaccaaa	gaccactttc	cacaacacag	ttcgtgaact	1680
cgtcacaaca	tctttataca	gctgtcgagc	agttgacacc	aacagatttg	cagagcccag	1740
tggtatcagc	caagaataat	gatgaaacca	gtgccagtat	gccatctgtt	caactgaaga	1800



ggaaecttgg tgtacacaaa aataaaatat gggatgagtg gctctctcaa agcagtttga 1860  
 tcggaaggggt atctgttgtt gctttactgg gttgcaccgt gttcttctct ctgaagctat 1920  
 caggcattag gtctggtaga ctacagagta tgcctatatc ggtttctgct aggccgcatt 1980  
 cagaatcaga ttcttttctg tggaaaacag agtctgggaa tttcagaaaa aaccttgatt 2040  
 ctgtgaatag aaatgggtatc gtgggaaaca tcaaagtgtc cattgacatg ttaaagatgc 2100  
 attgtggcga acatccggat gccctgtatc tgaaaagctc tgggtcaatca gctacatcat 2160  
 tgtctcattc tgcgtcagaa ctgcataaga gaccaatgga tacagaagaa gcggaagagc 2220  
 ttgtgagaca gtgggaaaaat gttaaggctg aagctcttgg accaacaacat caagtttata 2280  
 gcctttccga agtccttgat gaatccatgc ttgtccagtg gcaaacattg gcacaaacag 2340  
 cagaggcgaa atcctgttat tggagggtcg ttctgcttca tcttgagggt ttgcaagcac 2400  
 atatattcga agatgggtatt gctggtgagg ctgcagaaat cgaagctctt ctggaggaag 2460  
 cagcagaatt agttgatgaa tctcagccca aaaacgcaaa atattatagc acttacaaga 2520  
 tccgatatat tctgaagaag caagaagatg gattgtggaa attctgcca agcgatatc 2580  
 aaatacagaa gtgaaaatcc cccagaaaaa aaagctcatc atctaactaa aggttgtagc 2640  
 atcaacagta gaacatggga tcatttagct aacggttgtt cttgtttacc taacggtgta 2700  
 ggaaagtctc aggtttgttt ctttattcct tagtaaccca caggatttgt cttttagat 2760  
 tcttttgatt tcaatgtgtt tatggataaa caaacttctt gagtattttt tttattatta 2820  
 ttgtaaagcg ttactgatca caaaaaaaaa aaaaaaa 2857

<210> 173  
 <211> 819  
 <212> PRT  
 <213> Arabidopsis thaliana  
 <400> 173

Met Pro Val Ala Tyr Thr Phe Pro Val Leu Pro Ser Ser Cys Leu Leu  
 1 5 10 15

Cys Gly Ile Ser Asn Arg Ser Thr Ser Phe Val Val Asp Arg Pro Glu  
 20 25 30

Leu Gln Ile Ser Gly Leu Leu Val Val Arg Ser Glu Ser Gly Glu Phe  
 35 40 45

Phe Gly Ser Gly Leu Ser Leu Arg Arg Phe Gln Arg Glu Gly Arg Arg  
 50 55 60

Arg Leu Asn Ala Ala Gly Gly Gly Ile His Val Val Asp Asn Ala Pro  
 65 70 75 80

Ser Arg Thr Ser Ser Leu Ala Ala Ser Thr Ser Thr Ile Glu Leu Pro  
 85 90 95  
 Val Thr Cys Tyr Gln Leu Ile Gly Val Ser Glu Gln Ala Glu Lys Asp  
 100 105 110  
 Glu Val Val Lys Ser Val Ile Asn Leu Lys Lys Thr Asp Ala Glu Glu  
 115 120 125  
 Gly Tyr Thr Met Glu Ala Ala Ala Ala Arg Gln Asp Leu Leu Met Asp  
 130 135 140  
 Val Arg Asp Lys Leu Leu Phe Glu Ser Glu Tyr Ala Gly Asn Leu Lys  
 145 150 155 160  
 Glu Lys Ile Ala Pro Lys Ser Pro Leu Arg Ile Pro Trp Ala Trp Leu  
 165 170 175  
 Pro Gly Ala Leu Cys Leu Leu Gln Glu Val Gly Gln Glu Lys Leu Val  
 180 185 190  
 Leu Asp Ile Gly Arg Ala Ala Leu Arg Asn Leu Asp Ser Lys Pro Tyr  
 195 200 205  
 Ile His Asp Ile Phe Leu Ser Met Ala Leu Ala Glu Cys Ala Ile Ala  
 210 215 220  
 Lys Ala Ala Phe Glu Val Asn Lys Val Ser Gln Gly Phe Glu Ala Leu  
 225 230 235 240  
 Ala Arg Ala Gln Ser Phe Leu Lys Ser Lys Val Thr Leu Gly Lys Leu  
 245 250 255  
 Ala Leu Leu Thr Gln Ile Glu Glu Ser Leu Glu Gly Leu Ala Pro Pro  
 260 265 270  
 Cys Thr Leu Asp Leu Leu Gly Leu Pro Arg Thr Pro Glu Asn Ala Glu  
 275 280 285  
 Arg Arg Arg Gly Ala Ile Ala Ala Leu Arg Glu Leu Leu Arg Gln Gly  
 290 295 300  
 Leu Ser Val Glu Ala Ser Cys Gln Ile Gln Asp Trp Pro Cys Phe Leu  
 305 310 315 320  
 Ser Gln Ala Ile Ser Arg Leu Leu Ala Thr Glu Ile Val Asp Leu Leu

325	330	335
Pro Trp Asp Asp Leu Ala Ile Thr Arg Lys Asn Lys Lys Ser Leu Glu		
340	345	350
Ser His Asn Gln Arg Val Val Ile Asp Phe Asn Cys Phe Tyr Met Val		
355	360	365
Leu Leu Gly His Ile Ala Val Gly Phe Ser Gly Lys Gln Asn Glu Thr		
370	375	380
Ile Asn Lys Ala Lys Thr Ile Cys Glu Cys Leu Ile Ala Ser Glu Gly		
385	390	395
Val Asp Leu Lys Phe Glu Glu Ala Phe Cys Ser Phe Leu Leu Lys Gln		
405	410	415
Gly Ser Glu Ala Glu Ala Leu Glu Lys Leu Lys Gln Leu Glu Ser Asn		
420	425	430
Ser Asp Ser Ala Val Arg Asn Ser Ile Leu Gly Lys Glu Ser Arg Ser		
435	440	445
Thr Ser Ala Thr Pro Ser Leu Glu Ala Trp Leu Met Glu Ser Val Leu		
450	455	460
Ala Asn Phe Pro Asp Thr Arg Gly Cys Ser Pro Ser Leu Ala Asn Phe		
465	470	475
Phe Arg Ala Glu Lys Lys Tyr Pro Glu Asn Lys Lys Met Gly Ser Pro		
485	490	495
Ser Ile Met Asn His Lys Thr Asn Gln Arg Pro Leu Ser Thr Thr Gln		
500	505	510
Phe Val Asn Ser Ser Gln His Leu Tyr Thr Ala Val Glu Gln Leu Thr		
515	520	525
Pro Thr Asp Leu Gln Ser Pro Val Val Ser Ala Lys Asn Asn Asp Glu		
530	535	540
Thr Ser Ala Ser Met Pro Ser Val Gln Leu Lys Arg Asn Leu Gly Val		
545	550	555
His Lys Asn Lys Ile Trp Asp Glu Trp Leu Ser Gln Ser Ser Leu Ile		
565	570	575

Gly Arg Val Ser Val Val Ala Leu Leu Gly Cys Thr Val Phe Phe Ser  
580 585 590

Leu Lys Leu Ser Gly Ile Arg Ser Gly Arg Leu Gln Ser Met Pro Ile  
595 600 605

Ser Val Ser Ala Arg Pro His Ser Glu Ser Asp Ser Phe Leu Trp Lys  
610 615 620

Thr Glu Ser Gly Asn Phe Arg Lys Asn Leu Asp Ser Val Asn Arg Asn  
625 630 635 640

Gly Ile Val Gly Asn Ile Lys Val Leu Ile Asp Met Leu Lys Met His  
645 650 655

Cys Gly Glu His Pro Asp Ala Leu Tyr Leu Lys Ser Ser Gly Gln Ser  
660 665 670

Ala Thr Ser Leu Ser His Ser Ala Ser Glu Leu His Lys Arg Pro Met  
675 680 685

Asp Thr Glu Glu Ala Glu Glu Leu Val Arg Gln Trp Glu Asn Val Lys  
690 695 700

Ala Glu Ala Leu Gly Pro Thr His Gln Val Tyr Ser Leu Ser Glu Val  
705 710 715 720

Leu Asp Glu Ser Met Leu Val Gln Trp Gln Thr Leu Ala Gln Thr Ala  
725 730 735

Glu Ala Lys Ser Cys Tyr Trp Arg Phe Val Leu Leu His Leu Glu Val  
740 745 750

Leu Gln Ala His Ile Phe Glu Asp Gly Ile Ala Gly Glu Ala Ala Glu  
755 760 765

Ile Glu Ala Leu Leu Glu Glu Ala Ala Glu Leu Val Asp Glu Ser Gln  
770 775 780

Pro Lys Asn Ala Lys Tyr Tyr Ser Thr Tyr Lys Ile Arg Tyr Ile Leu  
785 790 795 800

Lys Lys Gln Glu Asp Gly Leu Trp Lys Phe Cys Gln Ser Asp Ile Gln  
805 810 815

Ile Gln Lys

<210> 174  
 <211> 491  
 <212> DNA  
 <213> Triticum aestivum

<220>  
 <221> misc feature  
 <222> (22)..(22)  
 <223> n is a, c, g, or t

<220>  
 <221> misc feature  
 <222> (451)..(451)  
 <223> n is a, c, g, or t

<220>  
 <221> misc feature  
 <222> (471)..(471)  
 <223> n is a, c, g, or t

<220>  
 <221> misc feature  
 <222> (483)..(484)  
 <223> n is a, c, g, or t

<220>  
 <221> misc feature  
 <222> (487)..(487)  
 <223> n is a, c, g, or t

<220>  
 <221> misc feature  
 <222> (489)..(490)  
 <223> n is a, c, g, or t

<400> 174  
 ggccgctcggc aaatactgca gnttgcaeat gatactetca caaaccagag ctcccgcacc 60  
 gagtatgacc gcgcgctctc tgaggaccgt gacgcggcgc tcacactgga tgttgcttgg 120  
 gacaagggtc cgggtgtgct atgtgccctt caggaggctg gggaggcaca ggcagtgtct 180  
 gcaattggag agcacttact ggaggaccgc ccgccaagc ggttcaagca ggatgtggtg 240  
 ctggcaatgg cgctcgctta tgtggacata tcaagggatg caatggcggc tagccctcca 300  
 gatgtaatcc gctgctgtga ggtgcttgaa agggctctca agctcttgca ggaggatggg 360  
 gcaatcaacc ttgcacctgg tctgctttca caaattgatg aaactctgga ggagatcaca 420  
 cctcgttgtg ttttgagact tcttgccctt nctcttgatg aaaaacatca nattgaacgc 480  
 cannaangnn t 491

<210> 175  
 <211> 545  
 <212> DNA  
 <213> Gossypium arboreum

<220>  
 <221> misc\_feature  
 <222> (528)..(528)  
 <223> n is a, c, g, or t

<220>  
 <221> misc\_feature  
 <222> (536)..(536)  
 <223> n is a, c, g, or t

<220>  
 <221> misc\_feature  
 <222> (540)..(540)  
 <223> n is a, c, g, or t

<400> 175  
 aattgcagaa ggcattgttc gcaagtggca gaacattaaa tctgaggcgt ttggacctga 60  
 tcaccgcctt gataaattgc cagaggttct ggatgggtcaa atgttgaaga catggacaga 120  
 tcgtgcagcc gaaatcgctc agcttgggtg ggtatatgaa tatagtctac tgaacatggc 180  
 cattgacagt gttacccttt cactagatgg ccagcgagct gtagtcgaag ctactctgga 240  
 agaatccacc tgcttgactg atgttcatca tccggagaac aatgcctcta atgtaaactc 300  
 ctacaccacg agatatgaga tgtcttgttc caactcaggc tggaaaatca ctgaaggatc 360  
 tgtctacaaa tcttaactat gatgtataaa gcataaaaag cctgaaagct ccaatgtggt 420  
 taccagcttt gcctttttac gtagctatat ttgttatatt gtttgagaaa acaagagtta 480  
 gcgtttttcca gtcattgcaag cagttcaaat taaaagaggc aatgcttntc atgganaacn 540  
 aaatg 545

<210> 176  
 <211> 420  
 <212> DNA  
 <213> Hordeum vulgare

<400> 176  
 gatgagccca tacagattcc taaaatggat gcgaagctgg cagaagatat tgttcgcaag 60  
 tggcagagca tcaaattcaa ggccttggga tcagatcatt ctgttgcac attgcaagag 120  
 gttcttgatg gcaacatgct gaaggatgg acagaccgag cagcagagat tgagcgcaaa 180  
 ggctggttct gggactacac gctgttcaac gtggcgatcg acagcatcac cgtctccctg 240  
 gacggacggc gggcgaccgt ggaggcgaca attgaggagg cgggtcagct caccgacgca 300  
 accgacccca ggaacgatga tttgtacgac actaagtaca ccaccggta cgagatggcc 360  
 ttcaccggac caggaggggtg gaagataacc gaaggcgag tcctcaagtc gtcatagggc 420

<210> 177  
 <211> 606  
 <212> DNA  
 <213> Triticum aestivum

<400> 177  
ctgcaaactct agcactatgt ttctctttat ctccaggatc tagcctagca ccaacaatcc 60  
aaatacaaca caagaaaaat aaagctcttc gtcgatcaca tcagactaac gcaactatcg 120  
gtcttccaaa ctaaaaaggg cctagactgc ctgcttattt acacaccccc aaaagaaaac 180  
tggaaggaat taacaaactt aatgagggtta ccgcacacca actaccctaa gacgacttga 240  
ggaccgcgcc ttccattatc ttccaccctc ctagtccggt gaaggtcac tcataccggg 300  
tggtgtactt cgtgtcgtac gagtcgttgt tcttggggtc ggttgcgtcg atgagctggc 360  
ctgcctcctc gatcgttgcc tccacggtcg cccgccgtcc gtccagggag accgtgatgc 420  
tgtcgatcgc cacgtcagac agtgtgtagt cccagaacca gcctttgcgc ccgatctccg 480  
ctgctcgggc cgtccatacc ttcagcatgt tgccatcaag aacctcttgc aatgattcca 540  
cagaatgatc tgatcccaag gccttggttt tgatactctg ccacttgcca acaatatctt 600  
ctgcca 606

<210> 178  
<211> 563  
<212> DNA  
<213> *Gossypium arboreum*

<400> 178  
tttttttttt tttttttttt tttttttttt ttttttttaa cttgcctctt ttaatttgaa 60  
ctgcttgcct gactggaaaa ccctaactct tgttttctca aacaatttaa caaatatagc 120  
tccctaaaaa ggcaaagctg gtaaccacat tggagctttc aggcttttta tgctttatac 180  
atcatagtta aaattttagt acagatcctt cagtgatctt ccaacctgag ttggaacaaa 240  
acatctcata tttcgtgggg taggagttta cattacaggc attgttctcc ggatgatgaa 300  
cattactcaa gccggggggg tcttccaaaa taacttcgac tacagctcgc tggccattta 360  
atgaaagggg aacactgtca atggccctgt tcagtcaact ttattcatat acccaaccca 420  
gctgaccgat ttcggctgca ccaactgtcc atgttttcaa catttgacca tccaaaacct 480  
ttggcaattt atcaaggggg ggatcaagtc caaacgcctc agatttaatg ttctgccact 540  
tgccaacaat gccttttgca att 563

<210> 179  
<211> 360  
<212> DNA  
<213> *Hordeum vulgare*

<400> 179  
gatgagccca tacagattcc taaaatggat gcgaagctgg cagaagatat tgttcgcaag 60  
tggcagagca tcaaatacaa ggccttggga tcagatcatt ctgttgcac attgcaagag 120  
gttcttgatg gcaacatgct gaaggatgg acagaccgag cagcagagat tgagcgcaaa 180

ggctggttct	gggactacac	gctgttcaac	gtggcgatcg	acagcatcac	cgtctccctg	240
gacggacggc	gggcgaccgt	ggaggcgaca	attgaggagg	cggttcagct	caccgacgca	300
accgacccca	ggaacgatga	ttgttacgac	actaagtaca	ccacccggta	cgagatggcc	360

<210> 180  
 <211> 300  
 <212> DNA  
 <213> *Hordeum vulgare*

<400> 180	
tgatggcaac	atgctgaagg tatggacaga ccgagcagca gagattgagc gcaaaggctg 60
gttctgggac	tacacgctgt tcaacgtggc gatcgacagc atcaccgtct ccctggacgg 120
acggcggggcg	accgtggagg cgacaattga ggaggcgggt cagctcaccg acgcaaccga 180
ccccaggaac	gatgatttgt acgacactaa gtacaccacc cggtacgaga tggccttcac 240
cggaccagga	gggtggaaga taaccgaagg cgcagtcctc aagtcgtcat agggcgttca 300

<210> 181  
 <211> 549  
 <212> DNA  
 <213> *Triticum monococcum*

<400> 181	
tttttttttt	tttttttttt ttttttttca gcggcaaatt cagcactatg tttctcttat 60
ccccaaactca	aagatcttct aagctagcaa taatccgaaa acgacacagg gaaaaacaaa 120
gctcatcgct	gattgcacat cagactaacc aaactatctc caacttccaa actgagaagg 180
gcctagactg	cttatttaca caccaaaaag aacacgggag gaatcaatca acaaaggctc 240
actgcacacc	gaacgcccta tgacgacttg aggaccgcac cttctgttat cttccaccct 300
cctggtccag	tgaaggatcat ctcgtaccgg gtggtgtact tagtgctgta caaatcggtg 360
ttcctggggg	cggttgcac ggtaagctgg cctgcctcct caattgtcgc ctccacagtc 420
gcccgtcgtc	cgtccaggga gacggtgatg ctgtcaatcg ccacgtcgga cagcgtgtag 480
tcccagaacc	agcctttgcg ctcgatctct gctgctcggt ccctccatac cttcagcatg 540
ttgccatca	549

<210> 182  
 <211> 573  
 <212> DNA  
 <213> *Hordeum vulgare*

<220>  
 <221> misc\_feature  
 <222> (6)..(6)  
 <223> n is a, c, g, or t



```

<220>
<221> misc_feature
<222> (16)..(16)
<223> n is a, c, g, or t

<400> 182
gcgagnaagg acgagnatcg tcaagtcggc catcgagctg aggaaatcgg agatcgaaga      60
tgggtacacg gaggaggtgt ccacctgcag acaggctctg ctgctggacg tgagagacaa      120
gcttctcttt gaacaggagt acgcaggaag caccagggcc aagggtccgc ccagatcctc      180
tcttcatata ccctggagct ggttgccctgc tgccttgtgt gtcttgacagg aggttgggga      240
agagaagctg gtcttggaca ttggtcaggc agctctacga cgccctgatt ctaagccata      300
tgctcacgat gtacttcttg caatggcact agctgaatgc tccattgcaa aagctagctt      360
tgaaaaaagt aaagtatctc ttggctttga ggctctagca cgtgctcaat atcttttgag      420
gaaaaaacca tctttagaga agatgcctct tcttgagcag atcgaagaat cacttgaaga      480
gcttgacca gcttgactc tagaggtttt aagcctgccc cgtacacctg aaaattctga      540
acgcaggcgt ggtgctattg cagctctctg tga                                     573

```

```

<210> 183
<211> 400
<212> DNA
<213> Beta vulgaris

```

```

<400> 183
gcataacacg gcaagaagat gttgcagtta atggcttttg aaatgaggat gttacaatgg      60
agcttgggccg tgataacact ttagattatg tgaatttagc cagttcaaat tttactgaag      120
ataatatcga gcaagaatcg gttactgaga agataaaaga tttaggtgtg aaggttatgt      180
gtgccggtgt ggtgattgga ctgacaactt tggctggcat gaaacttttg cctggcagaa      240
gtgggtctgc cattccacac aggcattctg gttctgctgt ggcttctgat gtctccagtg      300
tggggctctc agtaaatgaa actactgagg agaaagtacc aaaaatggat gcaagacttg      360
cagaagttct agttagaaga tggcagaacg ttaaatacaca                               400

```

```

<210> 184
<211> 631
<212> DNA
<213> Prunus persica

```

```

<220>
<221> misc_feature
<222> (21)..(21)
<223> n is a, c, g, or t

<400> 184
gcagttgcaa ttgctggggg ngattcacta cgtgaaaatt tcatgaacga ggccttcttg      60

```

catatgactg cagctgagca ggttgattta tttgtagcta cccccagtaa tatccccggca	120
gaaagctttg aagtttatgg ggtggctctt gcgcttggtg ctcaagcctt tgttggtaaa	180
aaacctcatc acattcaaga tgctgaaaac ctattccaga aacttcagca gtctaaggta	240
acagctgtag gacattctct tgacaactat ataaccaaag aaagcagtga gatagacttt	300
gctttggaga ggggactctg ttcacttctt ctaggggacc ttgatgacag tcgttcgtgg	360
ttgggcctag acagtaatga ttcaccatat agaaatccat ctggtgtaga ctttgtcttg	420
gagaactcaa aggatgacga tgacaatgac aatgacaatg atcttcctgg actttgcaag	480
ctattggaga cgtgggtgat ggagggtgta ttccccaggt ttagagacac caaagacata	540
gagttcagac tgggagacta ctatgatgat cctacagtct tgagatactt agaaaggctg	600
gatggcacta atggttcacc cttagctgct g	631

<210> 185  
 <211> 647  
 <212> DNA  
 <213> Helianthus annuus

<400> 185	
cagaaagagg tggttgatt gatgactttg gctggcttga aatttatacc gtcttaaaca	60
ggctctacta gtactactgc tcgtaaagaa gttgattcgg ctctggcttc agacgtcacc	120
aatgtggagg attctagggt tgaggatgct gaagacattc ctaaaatgga tgcaagatta	180
gccgaaggtc tagttcgtaa gtggcagagc ataaaatccc aagcccttgg acctgagcat	240
tgccactcaa aattatcata ggtattagat ggtgaaatgc acaagatctg gcttcaacgg	300
gcaaccgaaa ttgctcaacg tggttggttt tgggactaca cgcttttaaa cattaccatt	360
gacagtgtta ccgtttcact cgatgggctg ttagctgttg tggaagcaac ccttgaagag	420
tctgccaaagt tgattgattt gacccacccg gaaaacaatg actcctataa tttaacttac	480
accacacgtt atgagatgtc gtgtgccaaag tcatcatgga aaatcacaaa gggggctgtc	540
ctcaaatcat aacagatgta attctttctc accttttctg tatttatctg ttattagatt	600
actcagcagt tgaatgatat gtttctccac catttcgatc atgagcg	647

<210> 186  
 <211> 652  
 <212> DNA  
 <213> Helianthus annuus

<400> 186	
tgtggtggtt ggattgatga ctttggctgg cttgaaattt acaccgtcca aaagaggctc	60
tactagtact actgctcgta aagaagttga ttcggctctg gcttcagacg tcaccaatag	120
gattctaggg ttgaggatgc tgaagacatt cctaaaatgg atgcaagatt agccgagggg	180

ctagttcgta agtggcagag cataaaatcc caagcccttg gacctgagca ttgccactca	240
aaattatcag aggtattaga tggtgaaatg cacaagatct ggcttcaacg ggcaaccgaa	300
attgctcaac gtggttggtt ttgggactac acgcttttaa acattaccat tgacagtgtt	360
accgtctcac tcgatgggag cttagctgtt gtggaagcaa cccttgaaga gtctgccaa	420
ttgattgatt tgacccaccc ggaaaacaat gactcctata atttaactta caccacacgt	480
tatgagatgt cgtgtgcaa gtcttcatgg aaaatcacia agggggctgt cctcaaatca	540
taacagatgt aattctttct caccttttct gtatttaact gttattagat tactcagcag	600
ttgaatgata tgtttctcca ccatatcgat catgagtgtg tttggtgctg cc	652

<210> 187  
 <211> 460  
 <212> DNA  
 <213> *Populus tremula*

<400> 187	
gactgaaaaa ataaaagatg ccagtatcaa aatatgtgtg ctggtgtggc aattggactg	60
ctgacttttag ctggcctgaa gtgttttctt cctaggactg gctccttcat tcgacagaaa	120
gaaattgggtt cggcaatggc atctgacacc atcaatttga attcagcagt agatgaacaa	180
atttccgagg acttaccacag aatggatgca aggggtgcag aggatatagt tcgcaagtgg	240
caaaacatta aatctcaggc ttttggaact gatcactgcc tggcaaaatt gccagaggtt	300
ttggatagtc agatgttgaa aatatggaca gatcgtgcgg ccgaaattgc acatcttggt	360
tgggtatacg agtatatgct gttggacctg actattgaca gtgtgactgt atctgtagat	420
ggcctaaatg ctgtagtaga agcaacactc aaagagtcaa	460

<210> 188  
 <211> 3933  
 <212> DNA  
 <213> *Chlamydomonas reinhardtii*

<400> 188	
atgaactcgg cggagcacgt ctctgttgcc gtggactatt accgaatgct gcacgttccc	60
cgcgtaagcc gccctgacgc cattcgcaag gcgtatgaga acctggtgaa gcaaccccc	120
gctgccgcgt actctgcgga caccctcttc gcacgcgcgg tgctactcaa ggcagccgcg	180
gagtcgctga ccgaccgga cctgcgccgc tcatatgacg ccaagctggc cgctggtcac	240
acagccctgc gcgtcagcca gcaggacct cccggagccc ttgtcgtgct gcaggaggtg	300
agccgtgctc tggcgaccgc tcaaccctt gcgaccgcta aaaccatcag cacatatagc	360
acatatataat tcccatgggt tctgtactac cgccacccc tctgaagggg gcgagtattc	420
attcttcacg catgagcgca gacttttacc ctatcaagtc ccgccctcgc ccgccttctc	480

ttccacaga	tcggcgagca	ccagttggtt	ctggatctgg	gtctgcgctg	gctagaggta	540
aacggcgggc	agcccgacgc	cggcgacgtg	gccgctgccg	tggccctggc	ctactgtgac	600
cgcgctggtg	agcgctcac	ctcccagctg	cagccgccgc	cggcctcagc	gctgccaggc	660
cccgatggcg	cggcggtgcc	gcacgcgcac	gtgggcgcgg	tgctgcccgc	atgcgacgac	720
ctggacgcag	cgctgagcaa	gctccggcgg	tacggcatgg	cgcagcagct	gcagcagcag	780
atcgtgggcg	cgctgcgggt	gaggctggag	caggggctgg	accggcaacc	ggcatagat	840
gtagacacag	ggatgtaggc	gtcgatgcga	ggggatggaa	gtatggggtc	ctgtgagtgt	900
gagccgatgg	aaggatataga	tgctgggagc	tggcgcaccc	gacccatgtc	atccaaggac	960
ttggctgatg	catcgctcac	ccccgcctc	caaccgaat	gccctcagga	cctggcgcca	1020
gagtacgcgt	gcgagctggc	cgccctgccg	ctgggcgcgg	agaccgccgc	ccggcgcgcc	1080
aagggcggtg	cgctcatgcg	cggtgtgctg	cgcgccgccg	ccaccgtggc	cgccgccaca	1140
gccaaagtagg	tgacaagcac	gcaggaaatc	gtgtgctata	ttgcattgcg	gtaccttgcc	1200
ttgcacgcg	gaggcagtc	tcgagaatgc	gtttcgctgc	cgtgatccgt	ttgctcgctg	1260
tgcccttatcc	gccaccccag	gcccagaggct	gctgctgacg	acagcgacga	cgacgaggctg	1320
gacccgcgca	gtgtgctggc	ggccgcccgc	cgcatgctga	cccgcagccg	cgacgtgctc	1380
acctgcagcg	agcaggtaga	gcgctgcaac	cgggcagtta	tagatggatg	caagtgcgtg	1440
gacgccgaac	gtacagtttt	tgctgtgttc	cccgcgtgca	ccttagccgc	tcctcctgca	1500
accctcactt	gcgacctcaa	tgcgtagcacc	ttagccgctc	ctcctgcaac	cctcagttgc	1560
gacctcacga	cacaccgtct	ggcttaccctc	tgccccacc	ccagggtggcc	ctgctgccgg	1620
acgcgctgcg	cggcagcggc	gtgtcgccca	ccccggacgc	gctgtacgac	ggcgccctgg	1680
cgcacctggc	ggacggcttc	cgcaacggct	ggccgcactc	cgtgcaccag	gtgggggagc	1740
gcgggtgcctg	gatgtctgga	tggtcactgg	ccgcaaggct	gtgcgcacca	tcgggtagag	1800
tgtaacaaaa	tgatgtgcgc	gcaatgaagg	gtgagcagat	tccagcctcc	ctctgtcggc	1860
tggcgtccaa	ctgtgccaac	tgcgcacaca	cctgcgcacg	ccccaggccg	accagctgct	1920
ggccaagctg	gaggcgacgc	aggcccgcg	agccgccatg	cgccgcgagc	agtccgagct	1980
ggccgcgcgc	gccgcagccc	gccgtgcat	gtacagcggc	cccgcgcgcg	cccacggctc	2040
cacctgtac	accaactaca	acaaccctgc	cggcagcggc	aatggcgcg	cgccgcgcgc	2100
gccccgcccc	atgcccattg	tgcccagggg	cgacggccag	cacgccatgg	cgcgctctgt	2160
ggcgcgcat	gtgcactcca	cggcgatggc	ggagcacgcg	gcgcgcagcg	cggctggcgg	2220
cgcgcgcggc	gcctccgatg	gcggcgcgca	cgccaacggc	gtggctctag	agcgggcccgt	2280
gtgcgcgcgtc	ctgctgggtg	actacaccgc	ggcggtggag	cggctggggc	tagacacgaa	2340

cgcggcggtg	gagcaggagc	agctgcgcga	gttcgtcctg	gtgcgccggg	gagggcctac	2400
tgcaaaacgt	gttgctcagg	gtcttgagat	accgaacaca	atgttttcgt	atacatctcc	2460
cgtcgagaga	gctatgcctc	caccgtcggc	ccggctccac	tgcacccgat	gcggttgag	2520
gccactcgc	ccaacggccg	cggcgacctg	cgcccgggcc	tgagggcgct	ggccacccgc	2580
tggctggagg	gcgtggcgct	ggcgtccttc	cgcgacactg	ccggcagccc	cgtgccgccg	2640
ctggaggcca	gctggttcgc	ggacctgcgt	gtcgcttct	atctgcaggt	gagggcgggc	2700
agaagagagg	ggggaaagg	aggcgagaag	gcgttccgc	cgctggcgca	acgggccatc	2760
ctggtggagc	acggcgctac	atcgcatctg	gtccaccgtc	tctggatgta	taattcgtgc	2820
actcttaacc	ggccgcgcag	gtatggcggc	tgtgccgcgt	ggagcaggtg	ctggccgccg	2880
cccacttcct	ggccaacctg	ctgcccaca	tgtcaaggc	catcgccggc	actgccgtca	2940
aggtcgcagc	caacaccgcc	gtggcagcct	ccgcgcgcga	gcgcctcagc	gccaccgtcg	3000
cggccagcac	cgccaccgcc	tcgtcatctt	cctctgccgc	ccgcggcgct	cgtgccgggtg	3060
ccctgagcgc	tgccaccgcc	gccgcacacg	ccgcgcgcgg	ccagcaggcg	aacgcggtcg	3120
gtgccagcat	cgtcggtgct	gacgtgctgc	ccccacacg	agtggccgcg	gctgccgcgg	3180
ctggcacagc	ggccgccgcc	gcagtcaccg	gccccgccct	cgcccggtgg	gctgcagctt	3240
ccgcctcttc	ctttgaggag	ggcgccgctg	aggccgctga	cctgcgtcgt	cgctttgtcg	3300
ccaccagccg	cggcgccagc	gcggccgtcg	gtgcgcccac	agcaccagcc	gctatgactg	3360
ggccccagca	cggcgccgcc	tctgctgcgc	agtcgcaccg	ggaggaggat	gaggattcgc	3420
acggcgggcca	ggaggggggg	gtgccgcggc	gcatgagcga	ggcggacctg	cgtgcgcacc	3480
tggcgggcct	ggagaaggcc	atgtgggact	cggagctgcc	gccgccgccg	ccatcccgcg	3540
cgcagaaggc	gctcacctac	gccgcaggac	tggtgagttg	ctgcgcagcc	tgacggccat	3600
agttgccgta	gtgccatagt	gaccgagcac	cgtgatgttt	aggacatggg	cggagaagtg	3660
ttaggacatg	aattgcatca	acgctgcaaa	tctggtgtat	ggtacgcgcg	ttccctgtca	3720
ccaacaaggc	tggtgaccaa	gctgctgctg	cccttgcaact	ctttcaacgc	ccgtctgcag	3780
ctggccgtgg	tggtggcctt	cctggtgtcc	agcttcttcc	gccgcaacga	cggcgccgcc	3840
tccgccctgg	caccgcgcgc	cgtcaccacc	gcctccgtgg	ccgttagcgc	gcagccgcgc	3900
aagccgggca	aggccaccgc	ctccgcgcac	tga			3933

<210> 189

<211> 2511

<212> DNA

<213> Chlamydomonas reinhardtii

<400> 189

atgaactcgg	cggagcacgt	ctctgttgcc	gtggactatt	accgaatgct	gcacgttccc	60
------------	------------	------------	------------	------------	------------	----

cgcgtaagcc gccctgacgc cattcgcaag gcgtatgaga acctggtgaa gcaaccccc	120
gctgccgcgt actctgcgga caccctcttc gcacgcgcgg tgctactcaa ggcagccgcg	180
gagtcgctga ccgacccgga cctgcgccgc tcatatgacg ccaagctggc cgctggtcac	240
acagccctgc gcgtcagcca gcaggaccta cccggagccc ttgtcgtgct gcaggagatc	300
ggcgagcacc agttggttct ggatctgggt ctgcgctggc tagaggtaaa cggcggccag	360
cccgcgccc gcgacgtggc cgctgccgtg gccctggcct actgtgaccg cgctggtagag	420
cgctcacct cccagctgca gccgccgccg gcctcagcgc tgccaggccc cgatggcgcg	480
gcggtgccgc acgcgcacgt gggcgcggtg ctgcccgcac gcgacgacct ggacgcagcg	540
ctgagcaagc tccggcggtg cggcatggcg cagcagctgc agcagcagat cgtgggcgcg	600
ctgcgggacc tggcgccaga gtacgcgtgc gagctggccg ccctgccgct gggcgccgag	660
accgccgccc ggcgcgcaa gggcggtggc ctcatgcgcg gtgtgctgcg cgccgccgcc	720
accgtggccg ccgccacagc caagcccag gctgctgctg acgacagcga cgacgacgag	780
gtggacccgc gcagtgtgct ggcggccgcc cgccgcacgc tgacccgcag ccgcgacgtg	840
ctcacctgca gcgagcaggt ggcctgctg ccggacgcgc tgcgcggcag cgggtgtgctg	900
cccaccccg acgcgctgta cgacggcgcc ctggcgacc tggtagacgg cttccgcaac	960
ggctggccgc actccgtgca ccaggccgac cagctgctgg ccaagctgga ggcgagcag	1020
gcccgcgcag ccgccatgcg ccgcgagcag tccgagctgg ccgccgccgc cgagcccg	1080
cgtgccatgt acagcgggtc cgccgccgcc cacgggtcca ccctgtacac caactacaac	1140
aacctgccg gcagcggcaa tggcgcgccg ccgccgccgc cccgccccat gcccatggtg	1200
cccagggcg acggccagca cgccatggcg gcgtctgtgg cggcgcatgt gactccacg	1260
gcgatggcg agcacgcggc gcgcagcgcg gctggcgggc ccgccggcg ctccgatggc	1320
ggcgcgcacg ccaacggcgt ggctctagag cgggccgtgt gcgccgtcct gctgggtgac	1380
tacaccgcgg cgggtggagc gctggggcta gacacgaacg cggcggtgga gcaggagcag	1440
ctgcgcgagt tcgtcctggc cactcgccc aacggccgcg gcgacctgcg cccgggcctg	1500
agggcgctgg ccacccgctg gctggagggc gtggcgctgg cgtccttccg cgacactgcc	1560
ggcagccccg tgccgccgct ggaggccagc tggttcgcg acctgcgtgt cgccttctat	1620
ctgcaggtat ggcggctgtg ccgcgtggag cagggtgctg ccgccgcca cttcctggcc	1680
aacctgctgc ccaacatgct caaggccatc gccggcactg ccgtcaaggt cgcagccaac	1740
accgccgtgg cagcctcccg cgcgcagcgc ctacgcgcca ccgtcgcggc cagcaccgcc	1800
accgcctcgt catcttcctc tgccgcccgc ggcgctcgtg ccggtgccct gagcgtgcc	1860
accgccgccg cacacgccgc gcgccccag caggcgaacg cggtcggtgc cagcatcgtc	1920

ggtgctgacg tgctgcccc cacagcagtg gccgcggctg ccgcggctgg cacagcggcc 1980  
 gccgccgcag tcaccggccc cgccctcggc cgtggcgctg cagcttccgc ctcttccttt 2040  
 gaggagggcg ccgctgaggc cgctgacctg cgtcgtcgct ttgtcgccac cagccgcggc 2100  
 gccagcgcgg ccgtcgggtg gccacagca ccagccgcta tgactggggc ccagcacggc 2160  
 gccgcctctg ctgcgcagtc gcaccgggag gaggatgagg attcgcacgg cggccaggag 2220  
 gggggcgctg cgcggcgcat gagcgaggcg gacctgcgtg cgcacctggc gggcctggag 2280  
 aaggccatgt gggactcgga gctgccgccg ccgccgccat cccgcgcgca gaaggcgctc 2340  
 acctacgccg caggactgct ggccgtggtg gtggccttcc tgggtgccag cttcttccgc 2400  
 cgcaacgacg gcgccgcctc cgccctggca cccgccgccg tcaccaccgc ctccgtggcc 2460  
 gttagcgcgc agcccgccaa gccgggcaag gccacccgct ccgcgcactg a 2511

<210> 190  
 <211> 836  
 <212> PRT  
 <213> Chlamydomonas reinhardtii  
 <400> 190

Met Asn Ser Ala Glu His Val Ser Val Ala Val Asp Tyr Tyr Arg Met  
 1 5 10 15

Leu His Val Pro Arg Val Ser Arg Pro Asp Ala Ile Arg Lys Ala Tyr  
 20 25 30

Glu Asn Leu Val Lys Gln Pro Pro Ala Ala Ala Tyr Ser Ala Asp Thr  
 35 40 45

Leu Phe Ala Arg Ala Val Leu Leu Lys Ala Ala Ala Glu Ser Leu Thr  
 50 55 60

Asp Pro Asp Leu Arg Arg Ser Tyr Asp Ala Lys Leu Ala Ala Gly His  
 65 70 75 80

Thr Ala Leu Arg Val Ser Gln Gln Asp Leu Pro Gly Ala Leu Val Val  
 85 90 95

Leu Gln Glu Ile Gly Glu His Gln Leu Val Leu Asp Leu Gly Leu Arg  
 100 105 110

Trp Leu Glu Val Asn Gly Gly Gln Pro Asp Ala Gly Asp Val Ala Ala  
 115 120 125

Ala Val Ala Leu Ala Tyr Cys Asp Arg Ala Gly Glu Arg Leu Thr Ser  
 130 135 140

Gln Leu Gln Pro Pro Pro Ala Ser Ala Leu Pro Gly Pro Asp Gly Ala  
145 150 155 160

Ala Val Pro His Ala His Val Gly Ala Val Leu Pro Ala Cys Asp Asp  
165 170 175

Leu Asp Ala Ala Leu Ser Lys Leu Arg Arg Tyr Gly Met Ala Gln Gln  
180 185 190

Leu Gln Gln Gln Ile Val Gly Ala Leu Arg Asp Leu Ala Pro Glu Tyr  
195 200 205

Ala Cys Glu Leu Ala Ala Leu Pro Leu Gly Ala Glu Thr Ala Ala Arg  
210 215 220

Arg Ala Lys Gly Val Ala Leu Met Arg Gly Val Leu Arg Ala Ala Ala  
225 230 235 240

Thr Val Ala Ala Ala Thr Ala Lys Pro Glu Ala Ala Ala Asp Asp Ser  
245 250 255

Asp Asp Asp Glu Val Asp Pro Arg Ser Val Leu Ala Ala Ala Arg Arg  
260 265 270

Met Leu Thr Arg Ser Arg Asp Val Leu Thr Cys Ser Glu Gln Val Ala  
275 280 285

Leu Leu Pro Asp Ala Leu Arg Gly Ser Gly Val Ser Pro Thr Pro Asp  
290 295 300

Ala Leu Tyr Asp Gly Ala Leu Ala His Leu Val Asp Gly Phe Arg Asn  
305 310 315 320

Gly Trp Pro His Ser Val His Gln Ala Asp Gln Leu Leu Ala Lys Leu  
325 330 335

Glu Ala Gln Gln Ala Arg Ala Ala Ala Met Arg Arg Glu Gln Ser Glu  
340 345 350

Leu Ala Ala Ala Ala Ala Ala Arg Arg Ala Met Tyr Ser Gly Pro Ala  
355 360 365

Ala Ala His Gly Pro Thr Leu Tyr Thr Asn Tyr Asn Asn Pro Ala Gly  
370 375 380

Ser Gly Asn Gly Ala Pro Pro Pro Pro Pro Arg Pro Met Pro Met Val



385		390		395		400									
Pro	Arg	Gly	Asp	Gly	Gln	His	Ala	Met	Ala	Ala	Ser	Val	Ala	Ala	His
				405					410					415	
Val	His	Ser	Thr	Ala	Met	Ala	Glu	His	Ala	Ala	Arg	Ser	Ala	Ala	Gly
			420					425					430		
Gly	Ala	Ala	Gly	Ala	Ser	Asp	Gly	Gly	Ala	His	Ala	Asn	Gly	Val	Ala
		435					440					445			
Leu	Glu	Arg	Ala	Val	Cys	Ala	Val	Leu	Leu	Gly	Asp	Tyr	Thr	Ala	Ala
	450					455					460				
Val	Glu	Arg	Leu	Gly	Leu	Asp	Thr	Asn	Ala	Ala	Val	Glu	Gln	Glu	Gln
465					470					475					480
Leu	Arg	Glu	Phe	Val	Leu	Ala	His	Ser	Pro	Asn	Gly	Arg	Gly	Asp	Leu
			485						490					495	
Arg	Pro	Gly	Leu	Arg	Ala	Leu	Ala	Thr	Arg	Trp	Leu	Glu	Gly	Val	Ala
			500					505					510		
Leu	Ala	Ser	Phe	Arg	Asp	Thr	Ala	Gly	Ser	Pro	Val	Pro	Pro	Leu	Glu
		515					520					525			
Ala	Ser	Trp	Phe	Ala	Asp	Leu	Arg	Val	Ala	Phe	Tyr	Leu	Gln	Val	Trp
	530					535					540				
Arg	Leu	Cys	Arg	Val	Glu	Gln	Val	Leu	Ala	Ala	Ala	His	Phe	Leu	Ala
545					550					555					560
Asn	Leu	Leu	Pro	Asn	Met	Leu	Lys	Ala	Ile	Ala	Gly	Thr	Ala	Val	Lys
				565					570					575	
Val	Ala	Ala	Asn	Thr	Ala	Val	Ala	Ala	Ser	Arg	Ala	Gln	Arg	Leu	Ser
			580					585					590		
Ala	Thr	Val	Ala	Ala	Ser	Thr	Ala	Thr	Ala	Ser	Ser	Ser	Ser	Ser	Ala
		595					600					605			
Ala	Arg	Gly	Ala	Arg	Ala	Gly	Ala	Leu	Ser	Ala	Ala	Thr	Ala	Ala	Ala
		610				615					620				
His	Ala	Ala	Arg	Arg	Gln	Gln	Ala	Asn	Ala	Val	Gly	Ala	Ser	Ile	Val
625					630					635					640

Gly Ala Asp Val Leu Pro Pro Thr Ala Val Ala Ala Ala Ala Ala Ala  
645 650 655

Gly Thr Ala Ala Ala Ala Val Thr Gly Pro Ala Leu Gly Arg Gly  
660 665 670

Ala Ala Ala Ser Ala Ser Ser Phe Glu Glu Gly Ala Ala Glu Ala Ala  
675 680 685

Asp Leu Arg Arg Arg Phe Val Ala Thr Ser Arg Gly Ala Ser Ala Ala  
690 695 700

Val Gly Ala Pro Thr Ala Pro Ala Ala Met Thr Gly Pro Gln His Gly  
705 710 715 720

Ala Ala Ser Ala Ala Gln Ser His Arg Glu Glu Asp Glu Asp Ser His  
725 730 735

Gly Gly Gln Glu Gly Gly Val Pro Arg Arg Met Ser Glu Ala Asp Leu  
740 745 750

Arg Ala His Leu Ala Gly Leu Glu Lys Ala Met Trp Asp Ser Glu Leu  
755 760 765

Pro Pro Pro Pro Pro Ser Arg Ala Gln Lys Ala Leu Thr Tyr Ala Ala  
770 775 780

Gly Leu Leu Ala Val Val Val Ala Phe Leu Val Ser Ser Phe Phe Arg  
785 790 795 800

Arg Asn Asp Gly Ala Ala Ser Ala Leu Ala Pro Ala Ala Val Thr Thr  
805 810 815

Ala Ser Val Ala Val Ser Ala Gln Pro Ala Lys Pro Gly Lys Ala Thr  
820 825 830

Arg Ser Ala His  
835

<210> 191  
<211> 2022  
<212> DNA  
<213> Thermosynechococcus elongatus

<400> 191  
gtgcgcattc ccctcgatta ttaccaagtg ttgggtgtgc ctattcaggc aacgccggag 60  
caaattgagc aggcctttcg ggaccggctg ttgcagctcc ctacccatca gcactcccc 120

accacagttg	ccacccgtcg	cgaactcatt	gagcaggcct	atgcagtttt	gcgagaaccg	180
gagcagcgcg	atgcctacga	tcgccactgc	cgtaccgttg	atccccgatga	tttgattgcc	240
cagttggatc	ccgatgccac	cactccccac	attgaaatta	gtgatgagca	attgtcgggg	300
gcactcctac	tgctgtatga	actaggaaat	tatgcccaag	ttgtcaacct	gggagacgcc	360
tttcttaaaa	aggatgtttt	tgagcgcaat	cgccccctaca	cttccccctgc	cgccgttgcc	420
gacattaccc	tcactgtggc	tttggcctat	ctggaattgg	gacgggagga	atggcagcgg	480
cagtcctatg	aatcagccgc	ctctcagcta	gaagccggtc	tccaggtact	tcagcgggta	540
aatttgtttc	ccgagctcca	ggagcagttt	cagacggaac	tgaatcggct	gcgtccctac	600
cgcattctgg	aattactggc	actgcctttg	tccgatagtg	cgaatcggca	gcgggggtatt	660
ttattgctgc	ggcaaatgct	gagtgcgcgc	gggggcattg	aggggcgcgg	tgacgatcgc	720
tcaggactaa	cagttgagga	ttttctgaaa	tttatTTTTgc	aactgcgcag	ccatcttacc	780
gtggcagaac	aacaggaact	ctttgaacgg	gaatcgcggc	gtccctcagc	ggtggccacc	840
taccttgogg	tacatgcctt	ggtagcacgg	ggagtgcattg	aactgcagcc	gagctatatt	900
tgtcggggcca	aggatttatt	gcagcagctg	ctcccccatc	aagacgtcta	tcttgaactt	960
gccagttgct	tgctgctttt	gggacagccc	accgaggcct	tggcagctct	tgaccacagc	1020
caagatcaac	cgactctgga	ctttatccgc	cgtcatgccc	gtgaggctgg	cgatcgactg	1080
ccgggggcttt	attactacac	cacacaatgg	ctcacggagg	aaatttatcc	tgcatctcgg	1140
gacttggggg	aaacacccgt	ggccttggag	gcttactttg	ctgatgcca	tgtccaaacc	1200
tatctagagg	ctctcagtga	ggactccatt	gccccctgaac	cccctgcgac	cactgcctct	1260
gcgctccctg	aagtgatcag	accaacgggtg	gccgtgcccc	ctccccctctc	cttcacagcg	1320
gaaacgttac	cgttgcagga	tcagagtcgg	ctgggtcagg	gcctttcggc	atcggctttt	1380
accccttctg	caactgcaac	ggggacatcg	atgccccaac	catcgccctg	caaacggcgc	1440
agccctcgaa	accgttgcg	ccaaaaacgt	cagacttgggt	tttggatggg	tgaggagtg	1500
gttcttgtgg	gtttaggggc	gttggcaaaa	gtctattggc	ccgccaaaac	cgctgaagcc	1560
ccccgcgcgc	cgggtgacacc	ggcaccaact	cctgtggcaa	cgccgacccc	aacgccacaa	1620
ccgacgacct	tagccatcac	tttaacacca	gagatggcgc	gcgatcgcct	ccacacttgg	1680
cagcaaatta	aagcccaagc	ccttggggcga	ccatttgagg	tggacaaact	aacaacgatt	1740
ttggcgggagc	cagaactcag	ccgctggcga	tcgcgggcac	agggtttaa	gtccgagggc	1800
agctattggg	tttataccct	aaagaactta	gaagtgaagg	aagtccgcct	caaaggagc	1860
gatcgtgtgg	aggtgttggc	agaagtcaac	gaggatgccc	gtttctatga	acaggggaacc	1920
ctgcgcactg	atatttccta	tagcgatccc	taccgggtca	tttatacctt	tatccgtcgc	1980

ggcaatcaat ggttgattca aggcattgcag gtgggttagtt aa

2022

<210> 192  
<211> 673  
<212> PRT  
<213> Thermosynechococcus elongatus

<400> 192

Met Arg Ile Pro Leu Asp Tyr Tyr Gln Val Leu Gly Val Pro Ile Gln  
1 5 10 15

Ala Thr Pro Glu Gln Ile Glu Gln Ala Phe Arg Asp Arg Leu Leu Gln  
20 25 30

Leu Pro Thr His Gln His Ser Pro Thr Thr Val Ala Thr Arg Arg Glu  
35 40 45

Leu Ile Glu Gln Ala Tyr Ala Val Leu Arg Glu Pro Glu Gln Arg Asp  
50 55 60

Ala Tyr Asp Arg His Cys Arg Thr Val Asp Pro Asp Asp Leu Ile Ala  
65 70 75 80

Gln Leu Asp Pro Asp Ala Thr Thr Pro His Ile Glu Ile Ser Asp Glu  
85 90 95

Gln Leu Ser Gly Ala Leu Leu Leu Leu Tyr Glu Leu Gly Asn Tyr Ala  
100 105 110

Gln Val Val Asn Leu Gly Asp Ala Phe Leu Lys Lys Asp Val Phe Glu  
115 120 125

Arg Asn Arg Pro Tyr Thr Ser Pro Ala Ala Val Ala Asp Ile Thr Leu  
130 135 140

Thr Val Ala Leu Ala Tyr Leu Glu Leu Gly Arg Glu Glu Trp Gln Arg  
145 150 155 160

Gln Ser Tyr Glu Ser Ala Ala Ser Gln Leu Glu Ala Gly Leu Gln Val  
165 170 175

Leu Gln Arg Val Asn Leu Phe Pro Glu Leu Gln Glu Gln Phe Gln Thr  
180 185 190

Glu Leu Asn Arg Leu Arg Pro Tyr Arg Ile Leu Glu Leu Leu Ala Leu  
195 200 205

Pro Leu Ser Asp Ser Ala Asn Arg Gln Arg Gly Ile Leu Leu Leu Arg  
 210 215 220  
 Gln Met Leu Ser Glu Arg Gly Gly Ile Glu Gly Arg Gly Asp Asp Arg  
 225 230 235 240  
 Ser Gly Leu Thr Val Glu Asp Phe Leu Lys Phe Ile Leu Gln Leu Arg  
 245 250 255  
 Ser His Leu Thr Val Ala Glu Gln Gln Glu Leu Phe Glu Arg Glu Ser  
 260 265 270  
 Arg Arg Pro Ser Ala Val Ala Thr Tyr Leu Ala Val His Ala Leu Val  
 275 280 285  
 Ala Arg Gly Val His Glu Leu Gln Pro Ser Tyr Ile Cys Arg Ala Lys  
 290 295 300  
 Asp Leu Leu Gln Gln Leu Leu Pro His Gln Asp Val Tyr Leu Glu Leu  
 305 310 315 320  
 Ala Ser Cys Leu Leu Leu Leu Gly Gln Pro Thr Glu Ala Leu Ala Ala  
 325 330 335  
 Leu Asp His Ser Gln Asp Gln Pro Thr Leu Asp Phe Ile Arg Arg His  
 340 345 350  
 Ala Gly Glu Ala Gly Asp Arg Leu Pro Gly Leu Tyr Tyr Tyr Thr Thr  
 355 360 365  
 Gln Trp Leu Thr Glu Glu Ile Tyr Pro Ala Phe Arg Asp Leu Gly Glu  
 370 375 380  
 Thr Pro Val Ala Leu Glu Ala Tyr Phe Ala Asp Ala Asn Val Gln Thr  
 385 390 395 400  
 Tyr Leu Glu Ala Leu Ser Glu Asp Ser Ile Ala Pro Glu Pro Pro Ala  
 405 410 415  
 Thr Thr Ala Ser Ala Leu Pro Glu Val Ile Arg Pro Thr Val Ala Val  
 420 425 430  
 Pro Pro Pro Leu Ser Phe Thr Ala Glu Thr Leu Pro Leu Gln Asp Gln  
 435 440 445  
 Ser Arg Leu Gly Gln Gly Leu Ser Ala Ser Ala Phe Thr Pro Ser Ala  
 450 455 460

Thr Ala Thr Gly Thr Ser Met Pro Gln Pro Ser Pro Arg Lys Arg Arg  
 465 470 475 480

Ser Pro Arg Asn Arg Cys Ala Gln Lys Arg Gln Thr Trp Phe Trp Met  
 485 490 495

Gly Ala Gly Val Val Leu Val Gly Leu Gly Ala Leu Ala Lys Val Tyr  
 500 505 510

Trp Pro Ala Lys Thr Ala Glu Ala Pro Pro Pro Pro Val Thr Pro Ala  
 515 520 525

Pro Thr Pro Val Ala Thr Pro Thr Pro Thr Pro Gln Pro Thr Thr Leu  
 530 535 540

Ala Ile Thr Leu Thr Pro Glu Met Ala Arg Asp Arg Leu His Thr Trp  
 545 550 555 560

Gln Gln Ile Lys Ala Gln Ala Leu Gly Arg Pro Phe Glu Val Asp Lys  
 565 570 575

Leu Thr Thr Ile Leu Ala Glu Pro Glu Leu Ser Arg Trp Arg Ser Arg  
 580 585 590

Ala Gln Gly Leu Lys Ser Glu Gly Ser Tyr Trp Val Tyr Thr Leu Lys  
 595 600 605

Asn Leu Glu Val Lys Glu Val Arg Leu Gln Arg Ser Asp Arg Val Glu  
 610 615 620

Val Leu Ala Glu Val Asn Glu Asp Ala Arg Phe Tyr Glu Gln Gly Thr  
 625 630 635 640

Leu Arg Thr Asp Ile Ser Tyr Ser Asp Pro Tyr Arg Val Ile Tyr Thr  
 645 650 655

Phe Ile Arg Arg Gly Asn Gln Trp Leu Ile Gln Gly Met Gln Val Val  
 660 665 670

Ser

<210> 193  
 <211> 2370  
 <212> DNA  
 <213> Trichodesmium erythraeum

<400> 193

gtgcggttc cattagatta ttatcgaatt ttaggtttac caattcaggc tactgctgaa	60
cagttgcggc aggcacatca agaccgcact cagcagtttc ctagaaggga gtattctgaa	120
gccacaatag ttgctcgtaa acagcttata gatgaggctt atgctgttct ttgcgatcct	180
gaacaacgtc aaacctatga tggtaacttt ttagctaaaa cctacgagcc aatagtagaa	240
gaactcaatc caagttctca gataaatttt gatcaagcac aagaaaaaga aaccacactt	300
aaggagacta gagaagttct tccggaaaata gcttctaaac agttaaaaaa aaggacaagt	360
tatcaaaaaca gagagactaa agctgcctct gattttcatt ctaatacccc tagtatagaa	420
atagaatatc cacaatttgt gggagccatc ctaattttac atgagctagg agaatatgag	480
ctagtattaa aaataactca cccttatctt cttaacaata gtataactat taaagatgga	540
cgttttggag acccagcatt agttttgcca gatgttgctc ttacagttgc tctagcaaat	600
ttagaattgg gcagagagga atggcaacaa ggacaatacg aaagtgcagc tacagcttta	660
gaggctggcc tagggttatt gctacgagaa aacctatttg tccaaatacg aggagagata	720
caagctgacc ttataagct acgtccttat agaataatgg agctaatagc actaccagag	780
gaaatagctc tagaccgtag ccgtggacta gaaattcttc aagatatgct caatgaacgg	840
ggaggaattg atggtcaagg tgaagatagc tctggacttg ggatagaaga ttttctaaag	900
tttgttcagc agctacgtca atacttaact acagcagagc aaaagaagtt atttgaggca	960
gaagcccttc gcccttccgc agttggtgca tatctagcgg ttatactttt tttagctcaa	1020
gggtttgctc aaaaacaacc agcctttatt cgtaaagcta agttgatgtt aatgcaattg	1080
ggtcggagtc aagatgtaaa tttagagaaa tctgtctgtg ctttactttt agggcaaact	1140
gaagaagcta gtcgttcatt agaacttagc catgaaaatg aacctctatc ctttattaaa	1200
gaaaattctc aacaatctcc agattttattg ccagggtctat gtctctatgc tgaacattgg	1260
ttgacagagg aggtttttcc acatttccgt gatttgctcg acaagtcagc ttctttgaaa	1320
gattattttg cagatcaaca tgttcaagct tatctagaag ctttacctac agaagcagag	1380
gtagctaatc aatgggtagt cgttcagcct cgtcgtagta atcacaataa aaaacaaatg	1440
ttcgacccca aggaacttga gaagttgaat gtatcagatt tggaggataa agatatttct	1500
cggttagatg ctactgctac tggattgtt gcttctggaa gtcaagggaag ttctaattta	1560
ctaggggcta gttctgatgg gttgcttcaa gaattagaaa aatcatcatc tactagaggt	1620
gggccaaaac aagtaactac taagagttct agtcactatt taggaaaaat tagggaaaag	1680
agtataagtg gtttacctga gtttaatgaa agtacatcta ttgagagtgg ggggttacct	1740
caatctatcc aagagcatag ttcacgtaga acttctgcta gaagagaacc tggttaagttt	1800
ggtcgtttta tattaatcgc aattgtggga tttttgttaa taggatttat tgggttggtta	1860

acaattaaaa ctatcggctg gttagtaa at gctttaggat gggaaagaga aaaactgatg 1920  
 atacaattgg ataggcctcc tatagaaatc ccagaacctg atcgggttaa cctcgcagca 1980  
 tcaggaccga taacaaaaga agtagcaagg cgaacaattc aaagttgggtt agatatcaag 2040  
 gcttctgctc ttggtcctaa tcataaaatt gaacaattac caaatatttt agtagaaccg 2100  
 gcactttctc gttggttacc tacagcta at gccctgaagc aagaaaagtc ataccgtagg 2160  
 tatgagcatg atttagaa at aagtaatata aagatgagta atacaaattc taatctcgct 2220  
 caagtagatg ctaaagtgat agaaaaggta gagttttatt ctgacaatgg tagattaact 2280  
 aatactaaca atgaaaactt atttggtcgt tatgatttag ttcgtaaaag tcaaaaatgg 2340  
 caaattagta attggaaggt attgagataa 2370

<210> 194  
 <211> 789  
 <212> PRT  
 <213> Trichodesmium erythraeum

<400> 194

Val Arg Ile Pro Leu Asp Tyr Tyr Arg Ile Leu Gly Leu Pro Ile Gln  
 1 5 10 15

Ala Thr Ala Glu Gln Leu Arg Gln Ala His Gln Asp Arg Thr Gln Gln  
 20 25 30

Phe Pro Arg Arg Glu Tyr Ser Glu Ala Thr Ile Val Ala Arg Lys Gln  
 35 40 45

Leu Ile Asp Glu Ala Tyr Ala Val Leu Cys Asp Pro Glu Gln Arg Gln  
 50 55 60

Thr Tyr Asp Gly Asn Phe Leu Ala Lys Thr Tyr Glu Pro Ile Val Glu  
 65 70 75 80

Glu Leu Asn Pro Ser Ser Gln Ile Asn Phe Asp Gln Ala Gln Glu Lys  
 85 90 95

Glu Thr Thr Leu Lys Glu Thr Arg Glu Val Leu Pro Glu Ile Ala Ser  
 100 105 110

Lys Gln Leu Lys Lys Arg Thr Ser Tyr Gln Asn Arg Glu Thr Lys Ala  
 115 120 125

Ala Ser Asp Phe His Ser Asn Thr Pro Ser Ile Glu Ile Glu Tyr Pro  
 130 135 140



Gln Phe Val Gly Ala Ile Leu Ile Leu His Glu Leu Gly Glu Tyr Glu  
145 150 155 160

Leu Val Leu Lys Ile Thr His Pro Tyr Leu Leu Asn Asn Ser Ile Thr  
165 170 175

Ile Lys Asp Gly Arg Phe Gly Asp Pro Ala Leu Val Leu Pro Asp Val  
180 185 190

Val Leu Thr Val Ala Leu Ala Asn Leu Glu Leu Gly Arg Glu Glu Trp  
195 200 205

Gln Gln Gly Gln Tyr Glu Ser Ala Ala Thr Ala Leu Glu Ala Gly Leu  
210 215 220

Gly Leu Leu Leu Arg Glu Asn Leu Phe Val Gln Ile Arg Gly Glu Ile  
225 230 235 240

Gln Ala Asp Leu Tyr Lys Leu Arg Pro Tyr Arg Ile Met Glu Leu Ile  
245 250 255

Ala Leu Pro Glu Glu Ile Ala Leu Asp Arg Ser Arg Gly Leu Glu Ile  
260 265 270

Leu Gln Asp Met Leu Asn Glu Arg Gly Gly Ile Asp Gly Gln Gly Glu  
275 280 285

Asp Ser Ser Gly Leu Gly Ile Glu Asp Phe Leu Lys Phe Val Gln Gln  
290 295 300

Leu Arg Gln Tyr Leu Thr Thr Ala Glu Gln Lys Lys Leu Phe Glu Ala  
305 310 315 320

Glu Ala Leu Arg Pro Ser Ala Val Gly Ala Tyr Leu Ala Val Tyr Thr  
325 330 335

Phe Leu Ala Gln Gly Phe Ala Gln Lys Gln Pro Ala Phe Ile Arg Lys  
340 345 350

Ala Lys Leu Met Leu Met Gln Leu Gly Arg Ser Gln Asp Val Asn Leu  
355 360 365

Glu Lys Ser Val Cys Ala Leu Leu Leu Gly Gln Thr Glu Glu Ala Ser  
370 375 380

Arg Ser Leu Glu Leu Ser His Glu Asn Glu Pro Leu Ser Phe Ile Lys  
385 390 395 400

Glu Asn Ser Gln Gln Ser Pro Asp Leu Leu Pro Gly Leu Cys Leu Tyr  
 405 410 415  
 Ala Glu His Trp Leu Thr Glu Glu Val Phe Pro His Phe Arg Asp Leu  
 420 425 430  
 Ser Asp Lys Ser Ala Ser Leu Lys Asp Tyr Phe Ala Asp Gln His Val  
 435 440 445  
 Gln Ala Tyr Leu Glu Ala Leu Pro Thr Glu Ala Glu Val Ala Asn Gln  
 450 455 460  
 Trp Val Val Val Gln Pro Arg Arg Ser Asn His Asn Lys Lys Gln Met  
 465 470 475 480  
 Phe Asp Pro Lys Glu Leu Glu Lys Leu Asn Val Ser Asp Leu Glu Asp  
 485 490 495  
 Lys Asp Ile Ser Arg Val Asp Ala Thr Ala Thr Gly Ile Val Ala Ser  
 500 505 510  
 Gly Ser Gln Gly Ser Ser Asn Leu Leu Gly Ala Ser Ser Asp Gly Leu  
 515 520 525  
 Leu Gln Glu Leu Glu Lys Ser Ser Ser Thr Arg Gly Gly Pro Lys Gln  
 530 535 540  
 Val Thr Thr Lys Ser Ser Ser His Tyr Leu Gly Lys Ile Arg Glu Lys  
 545 550 555 560  
 Ser Ile Ser Gly Leu Pro Glu Phe Asn Glu Ser Thr Ser Ile Glu Ser  
 565 570 575  
 Gly Gly Leu Pro Gln Ser Ile Gln Glu His Ser Ser Arg Arg Thr Ser  
 580 585 590  
 Ala Arg Arg Glu Pro Val Lys Phe Gly Arg Leu Ile Leu Ile Ala Ile  
 595 600 605  
 Val Gly Phe Leu Leu Ile Gly Phe Ile Gly Leu Leu Thr Ile Lys Thr  
 610 615 620  
 Ile Gly Trp Leu Val Asn Ala Leu Gly Trp Glu Arg Glu Lys Leu Met  
 625 630 635 640  
 Ile Gln Leu Asp Arg Pro Pro Ile Glu Ile Pro Glu Pro Asp Arg Val

645					650					655					
Asn	Leu	Ala	Ala	Ser	Gly	Pro	Ile	Thr	Lys	Glu	Val	Ala	Arg	Arg	Thr
		660						665					670		
Ile	Gln	Ser	Trp	Leu	Asp	Ile	Lys	Ala	Ser	Ala	Leu	Gly	Pro	Asn	His
		675					680					685			
Lys	Ile	Glu	Gln	Leu	Pro	Asn	Ile	Leu	Val	Glu	Pro	Ala	Leu	Ser	Arg
	690					695					700				
Trp	Leu	Pro	Thr	Ala	Asn	Ala	Leu	Lys	Gln	Glu	Lys	Ser	Tyr	Arg	Arg
705					710					715					720
Tyr	Glu	His	Asp	Leu	Glu	Ile	Ser	Asn	Ile	Lys	Met	Ser	Asn	Thr	Asn
				725					730					735	
Ser	Asn	Leu	Ala	Gln	Val	Asp	Ala	Lys	Val	Ile	Glu	Lys	Val	Glu	Phe
			740					745					750		
Tyr	Ser	Asp	Asn	Gly	Arg	Leu	Thr	Asn	Thr	Asn	Glu	Asn	Leu	Phe	
		755					760				765				
Val	Arg	Tyr	Asp	Leu	Val	Arg	Lys	Ser	Gln	Lys	Trp	Gln	Ile	Ser	Asn
	770					775					780				
Trp	Lys	Val	Leu	Arg											
785															
<210> 195															
<211> 765															
<212> PRT															
<213> Homo sapiens															
<400> 195															
Met	Gly	Asn	Arg	Gly	Met	Glu	Asp	Leu	Ile	Pro	Leu	Val	Asn	Arg	Leu
1				5					10					15	
Gln	Asp	Ala	Phe	Ser	Ala	Ile	Gly	Gln	Asn	Ala	Asp	Leu	Asp	Leu	Pro
		20					25						30		
Gln	Ile	Ala	Val	Val	Gly	Gly	Gln	Ser	Ala	Gly	Lys	Ser	Ser	Val	Leu
		35					40					45			
Glu	Asn	Phe	Val	Gly	Arg	Val	Thr	Arg	Arg	Pro	Leu	Val	Leu	Gln	Leu
	50					55					60				

Val Asn Ala Thr Thr Glu Tyr Ala Glu Phe Leu His Cys Lys Gly Lys  
65 70 75 80

Lys Phe Thr Glu Ala Glu Thr Asp Arg Val Thr Gly Thr Asn Lys Gly  
85 90 95

Ile Ser Pro Val Pro Ile Asn Leu Arg Val Tyr Ser Pro His Val Leu  
100 105 110

Asn Leu Thr Leu Val Asp Leu Pro Gly Met Thr Lys Val Pro Val Gly  
115 120 125

Asp Gln Pro Pro Asp Ile Glu Phe Gln Ile Arg Asp Met Leu Met Gln  
130 135 140

Phe Val Thr Lys Glu Asn Cys Ser Asp Leu Ala Asn Ser Asp Ala Leu  
145 150 155 160

Lys Val Ala Lys Glu Val Asp Pro Gln Gly Gln Arg Thr Ile Gly Val  
165 170 175

Ile Thr Lys Leu Asp Leu Met Asp Glu Gly Thr Asp Ala Arg Asp Val  
180 185 190

Leu Glu Asn Lys Leu Leu Pro Leu Arg Arg Gly Tyr Ile Gly Val Val  
195 200 205

Asn Arg Ser Gln Lys Asp Ile Asp Gly Lys Lys Asp Ile Thr Phe Leu  
210 215 220

Ser His Pro Ser Tyr Arg His Leu Ala Asp Arg Met Gly Thr Pro Tyr  
225 230 235 240

Leu Gln Lys Val Leu Asn Gln Gln Leu Thr Asn His Ile Arg Asp Thr  
245 250 255

Leu Pro Gly Leu Arg Asn Lys Leu Gln Ser Gln Leu Leu Ser Ile Glu  
260 265 270

Lys Glu Val Glu Glu Tyr Lys Asn Phe Arg Pro Asp Asp Pro Ala Arg  
275 280 285

Lys Thr Lys Ala Leu Asp Phe Glu Lys Arg Ile Glu Gly Ser Gly Asp  
290 295 300

Gln Ile Asp Thr Tyr Glu Leu Ser Gly Gly Ala Arg Ile Asn Arg Ile  
305 310 315 320

Phe His Glu Arg Phe Pro Phe Glu Leu Val Lys Met Glu Phe Asp Glu  
325 330 335  
Lys Glu Leu Arg Arg Glu Ile Ser Tyr Ala Ile Lys Asn Ile His Gly  
340 345 350  
Ile Arg Thr Gly Leu Phe Thr Pro Asp Met Ala Lys Lys Ile Arg Glu  
355 360 365  
Pro Cys Leu Lys Cys Val Asp Met Val Ile Ser Glu Leu Ile Ser Thr  
370 375 380  
Val Arg Gln Cys Thr Lys Lys Leu Gln Gln Tyr Pro Arg Leu Arg Glu  
385 390 395 400  
Glu Met Glu Arg Ile Val Thr Thr His Ile Arg Glu Arg Glu Gly Arg  
405 410 415  
Thr Lys Glu Gln Val Met Met Asn Thr Asn His Glu Asp Phe Ile Gly  
420 425 430  
Phe Ala Asn Ala Gln Gln Arg Ser Asn Gln Met Asn Lys Lys Lys Thr  
435 440 445  
Ser Gly Asn Gln Asp Glu Ile Leu Val Ile Arg Lys Gly Trp Leu Thr  
450 455 460  
Ile Asn Asn Ile Gly Ile Met Lys Gly Gly Ser Lys Glu Tyr Trp Phe  
465 470 475 480  
Val Leu Thr Ala Glu Asn Leu Ser Trp Tyr Lys Asp Asp Ser Val Asp  
485 490 495  
Asn Leu Lys Leu Arg Asp Val Glu Lys Gly Phe Met Ser Ser Lys His  
500 505 510  
Ile Phe Ala Leu Phe Asn Thr Glu Gln Arg Asn Val Tyr Lys Asp Tyr  
515 520 525  
Arg Gln Leu Glu Leu Ala Cys Glu Thr Gln Glu Glu Val Asp Ser Trp  
530 535 540  
Lys Ala Ser Phe Leu Arg Ala Gly Val Tyr Pro Glu Arg Val Gly Asp  
545 550 555 560  
Lys Glu Lys Asp Ser Phe Met His Ser Met Asp Pro Gln Leu Glu Arg

565					570					575					
Gln	Val	Glu	Thr	Ile	Arg	Asn	Leu	Val	Asp	Ser	Tyr	Met	Ala	Ile	Val
			580					585					590		
Asn	Lys	Thr	Val	Arg	Asp	Leu	Met	Pro	Lys	Thr	Ile	Met	His	Leu	Met
		595					600					605			
Ile	Asn	Asn	Thr	Lys	Glu	Phe	Ile	Phe	Ser	Glu	Leu	Leu	Ala	Asn	Leu
	610					615					620				
Tyr	Ser	Cys	Gly	Asp	Gln	Asn	Thr	Leu	Met	Arg	Asp	Glu	Met	Leu	Arg
625						630					635				640
Met	Tyr	His	Ala	Leu	Lys	Glu	Ala	Leu	Ser	Ile	Ile	Gly	Asn	Ile	Asn
				645					650					655	
Thr	Thr	Thr	Val	Ser	Thr	Pro	Met	Pro	Pro	Pro	Val	Asp	Asp	Ser	Trp
			660					665					670		
Leu	Gln	Val	Gln	Ser	Val	Pro	Ala	Gly	Arg	Arg	Ser	Pro	Thr	Ser	Ser
		675					680					685			
Pro	Thr	Pro	Gln	Arg	Arg	Ala	Pro	Ala	Val	Pro	Pro	Ala	Arg	Pro	Gly
	690					695					700				
Ser	Ala	Gly	Ser	Ala	Leu	Gly	Gly	Ala	Pro	Pro	Val	Pro	Ser	Arg	Pro
705						710					715				720
Gly	Ala	Ser	Pro	Asp	Pro	Phe	Gly	Pro	Pro	Pro	Gln	Val	Pro	Ser	Arg
				725					730					735	
Pro	Asn	Arg	Ala	Pro	Pro	Gly	Val	Pro	Ser	Arg	Ser	Gly	Gln	Ala	Ser
			740					745					750		
Pro	Ser	Arg	Pro	Glu	Ser	Pro	Arg	Pro	Pro	Phe	Asp	Leu			
		755					760					765			
<210> 196															
<211> 670															
<212> PRT															
<213> Saccharomyces cerevisiae															
<400> 196															
Met	Ala	Ser	Leu	Glu	Asp	Leu	Ile	Pro	Thr	Val	Asn	Lys	Leu	Gln	Asp
1				5				10						15	

Val Met Tyr Asp Ser Gly Ile Asp Thr Leu Asp Leu Pro Ile Leu Ala  
20 25 30

Val Val Gly Ser Gln Ser Ser Gly Lys Ser Ser Ile Leu Glu Thr Leu  
35 40 45

Val Gly Arg Val Thr Arg Arg Pro Leu Val Leu Gln Leu Asn Asn Ile  
50 55 60

Ser Pro Asn Ser Pro Leu Ile Glu Glu Asp Asp Asn Ser Val Asn Pro  
65 70 75 80

His Asp Glu Val Thr Lys Ile Ser Gly Phe Glu Ala Gly Thr Lys Pro  
85 90 95

Leu Glu Tyr Arg Gly Lys Glu Arg Asn His Ala Asp Glu Trp Gly Glu  
100 105 110

Phe Leu His Ile Pro Gly Lys Arg Phe Tyr Glu Asn Glu Thr Ala Arg  
115 120 125

Ile Ala Gly Lys Asp Lys Gly Ile Ser Lys Ile Pro Ile Asn Leu Lys  
130 135 140

Val Phe Ser Pro His Val Leu Asn Leu Thr Leu Val Asp Leu Pro Gly  
145 150 155 160

Ile Thr Lys Val Pro Ile Gly Glu Gln Pro Pro Asp Ile Glu Lys Gln  
165 170 175

Ile Lys Asn Leu Ile Leu Asp Tyr Ile Ala Thr Pro Asn Cys Val Asp  
180 185 190

Leu Val Asn Ser Glu Ser Leu Lys Leu Ala Arg Glu Val Asp Pro Gln  
195 200 205

Gly Lys Arg Thr Ile Gly Val Ile Thr Lys Leu Asp Leu Met Asp Ser  
210 215 220

Gly Thr Asn Ala Leu Asp Ile Leu Ser Gly Lys Met Tyr Pro Leu Lys  
225 230 235 240

Leu Gly Phe Val Gly Val Val Asn Arg Ser Gln Gln Asp Ile Gln Leu  
245 250 255

Asn Lys Thr Val Glu Phe Arg Lys His Pro Val Tyr Arg Thr Ile Ser  
260 265 270

Thr Lys Cys Gly Thr Arg Tyr Leu Ala Lys Leu Leu Asn Gln Thr Leu  
 275 280 285  
 Leu Ser His Ile Arg Asp Lys Leu Pro Asp Ile Lys Thr Lys Leu Asn  
 290 295 300  
 Thr Leu Ile Ser Gln Thr Glu Gln Glu Leu Ala Arg Tyr Gly Gly Val  
 305 310 315 320  
 Gly Ala Thr Thr Asn Glu Ser Arg Ala Ser Leu Val Asn Phe Ile Ser  
 325 330 335  
 Ser Ile Asp Gly Thr Ser Ser Asp Ile Asn Thr Lys Glu Leu Cys Gly  
 340 345 350  
 Gly Ala Arg Ile Tyr Tyr Ile Tyr Asn Asn Val Phe Gly Asn Ser Leu  
 355 360 365  
 Lys Ser Ile Asp Pro Thr Ser Asn Leu Ser Val Leu Asp Val Arg Thr  
 370 375 380  
 Ala Ile Arg Asn Ser Thr Gly Pro Arg Pro Thr Leu Phe Val Pro Glu  
 385 390 395 400  
 Leu Ala Lys Leu Leu Leu Glu Pro Ser Gln Arg Cys Val Glu Leu Val  
 405 410 415  
 Tyr Glu Glu Leu Met Lys Ile Cys His Lys Cys Gly Ser Ala Glu Leu  
 420 425 430  
 Ala Arg Tyr Pro Lys Leu Lys Ser Met Leu Ile Glu Val Ile Ser Glu  
 435 440 445  
 Leu Leu Arg Glu Arg Leu Gln Pro Thr Arg Ser Tyr Val Glu Ile Asn  
 450 455 460  
 Thr Asn His Pro Asn Phe Leu Ser Ala Thr Glu Ala Met Asp Asp Ile  
 465 470 475 480  
 Met Lys Thr Arg Arg Lys Arg Asn Gln Glu Leu Leu Lys Ser Lys Leu  
 485 490 495  
 Ser Gln Gln Glu Asn Gly Gln Thr Asn Gly Ile Asn Gly Thr Ser Ser  
 500 505 510  
 Ile Ser Ser Asn Ile Asp Gln Asp Asp Gly Ile Asp Ala Glu Ser Lys



515	520	525
Gln Thr Lys Asp Lys Phe Leu Asn Tyr Phe Phe Gly Lys Asp Lys Lys 530 535 540		
Gly Gln Pro Val Phe Asp Ala Ser Asp Lys Lys Arg Ser Ile Ala Gly 545 550 555 560		
Asp Gly Asn Ile Glu Asp Phe Arg Asn Leu Gln Ile Ser Asp Phe Ser 565 570 575		
Leu Gly Asp Ile Asp Asp Pro Leu Thr Glu Arg Glu Glu Leu Glu Cys 580 585 590		
Glu Leu Ile Lys Arg Leu Ile Val Ser Tyr Phe Asp Ile Ile Arg Glu 595 600 605		
Met Ile Glu Asp Gln Val Pro Lys Ala Val Met Cys Leu Leu Val Asn 610 615 620		
Tyr Cys Lys Asp Ser Val Gln Asn Arg Leu Val Thr Lys Leu Tyr Lys 625 630 635 640		
Glu Thr Leu Phe Glu Glu Leu Leu Arg Glu Leu Cys Val Lys Ser Leu 645 650 655		
Gly Val Tyr Lys Lys Ala Ala Thr Leu Ile Ser Asn Ile Leu 660 665 670		
<210> 197		
<211> 690		
<212> PRT		
<213> Arabidopsis thaliana		
<400> 197		
Met Ala Glu Val Ser Ala Lys Ser Val Thr Val Glu Glu Met Ala Glu 1 5 10 15		
Glu Asp Asp Ala Ala Ile Glu Glu Arg Trp Ser Leu Tyr Glu Ala Tyr 20 25 30		
Asn Glu Leu His Ala Leu Ala Gln Glu Leu Glu Thr Pro Phe Glu Ala 35 40 45		
Pro Ala Val Leu Val Val Gly Gln Gln Thr Asp Gly Lys Ser Ala Leu 50 55 60		

Val	Glu	Ala	Leu	Met	Gly	Phe	Lys	Thr	Arg	Arg	Pro	Ile	Thr	Leu	His	65	70	75	80
Met	Lys	Tyr	Asp	Pro	Gln	Cys	Gln	Phe	Pro	Leu	Cys	His	Leu	Gly	Ser	85	90	95	
Asp	Asp	Asp	Pro	Ser	Val	Ser	Leu	Pro	Lys	Glu	Ala	Glu	Asn	Met	Arg	100	105	110	
Leu	Glu	Gln	Glu	Pro	Cys	Ser	Pro	Phe	Ser	Ala	Lys	Glu	Ile	Ile	Val	115	120	125	
Lys	Val	Gln	Tyr	Lys	Tyr	Cys	Pro	Asn	Leu	Thr	Ile	Ile	Asp	Thr	Pro	130	135	140	
Gly	Leu	Ile	Ala	Pro	Ala	Pro	Gly	Leu	Lys	Asn	Arg	Ala	Leu	Gln	Val	145	150	155	160
Gln	Ala	Arg	Ala	Val	Glu	Ala	Leu	Val	Arg	Ala	Lys	Met	Gln	His	Lys	165	170	175	
Glu	Ser	Asp	Trp	Ser	Ile	Ala	Thr	Thr	Arg	Arg	Ile	Val	Met	Gln	Val	180	185	190	
Asp	Pro	Glu	Leu	Ser	Arg	Thr	Ile	Val	Val	Ser	Thr	Lys	Leu	Asp	Thr	195	200	205	
Lys	Ile	Pro	Gln	Phe	Ser	Cys	Ser	Ser	Asp	Val	Glu	Val	Phe	Leu	Ser	210	215	220	
Pro	Pro	Ala	Ser	Ala	Leu	Asp	Ser	Ser	Leu	Leu	Gly	Asp	Ser	Pro	Phe	225	230	235	240
Phe	Tyr	Gly	Gln	Asp	Ser	Val	Tyr	Lys	Ser	Asn	Asp	Glu	Phe	Lys	Gln	245	250	255	
Ala	Val	Ser	Leu	Arg	Glu	Met	Glu	Asp	Ile	Ala	Ser	Leu	Glu	Lys	Lys	260	265	270	
Leu	Gly	Arg	Leu	Leu	Thr	Lys	Gln	Glu	Lys	Ser	Arg	Ile	Gly	Ile	Ser	275	280	285	
Lys	Leu	Arg	Leu	Phe	Leu	Glu	Glu	Leu	Leu	Trp	Lys	Arg	Tyr	Lys	Glu	290	295	300	
Ser	Val	Pro	Leu	Ile	Ile	Pro	Leu	Arg	Lys	Leu	Asp	Thr	Val	Ser	Lys	305	310	315	320

Glu Leu Ser Ser Leu Asp Glu Ala Lys Leu Lys Glu Arg Gly Arg Thr  
325 330 335

Phe His Asp Leu Phe Leu Thr Lys Leu Ser Leu Leu Leu Lys Gly Thr  
340 345 350

Val Val Ala Pro Pro Asp Lys Phe Gly Glu Thr Leu Gln Asp Glu Arg  
355 360 365

Thr Gln Gly Gly Ala Phe Val Gly Thr Asp Gly Leu Gln Phe Ser Arg  
370 375 380

Leu Tyr Gly Gly Ala Gln Tyr His Arg Ala Met Ala Glu Phe Arg Phe  
385 390 395 400

Leu Val Gly Ala Ile Lys Cys Pro Pro Ile Thr Arg Glu Glu Ile Val  
405 410 415

Asn Ala Cys Gly Val Glu Asp Ile His Asp Gly Thr Asn Tyr Ser Arg  
420 425 430

Thr Ala Cys Val Ile Ala Val Ala Lys Ala Arg Glu Thr Phe Glu Pro  
435 440 445

Phe Leu His Gln Leu Gly Leu Leu Pro Ile Ser Val Tyr Leu Leu Gln  
450 455 460

Lys Glu Gly Glu Tyr Leu Ser Gly His Glu Val Phe Leu Lys Arg Val  
465 470 475 480

Ala Ser Ala Phe Asn Ser Phe Val Glu Ser Thr Glu Lys Ser Cys Arg  
485 490 495

Asp Lys Cys Met Glu Asp Leu Ala Ser Thr Thr Arg Tyr Val Thr Trp  
500 505 510

Ser Leu His Asn Lys Asn Ser Phe Gly Gly Thr Glu His Asn Thr Thr  
515 520 525

Ser Gly Asn Ala Ile Gly Phe Ser Leu Pro Gln Asp Ala Leu Gly Gly  
530 535 540

Thr Thr Asp Thr Lys Ser Arg Ser Asp Val Lys Leu Ser His Leu Ala  
545 550 555 560

Ser Asn Ile Asp Ser Gly Ser Ser Ile Gln Thr Thr Glu Met Arg Leu

565

570

575

Ala Asp Leu Leu Asp Ser Thr Leu Trp Asn Arg Lys Leu Ile Val Tyr  
580 585 590

Ala Leu Val Gln Gln Ile Phe Gln Gly Ile Arg Glu Tyr Phe Leu Ala  
595 600 605

Ser Ala Glu Leu Lys Phe Asn Cys Phe Leu Leu Met Pro Ile Val Asp  
610 615 620

Lys Leu Pro Ala Leu Leu Arg Glu Glu Leu Glu Asn Ala Phe Glu Asp  
625 630 635 640

Asp Leu Asp Ser Ile Phe Asp Ile Thr Asn Leu Arg Thr Glu Ile Glu  
645 650 655

Leu Arg Arg Val Lys Arg Ile Lys Glu Lys Phe Arg Val Met Asn Glu  
660 665 670

Lys Leu Asn Ser His Glu Phe Ala Gln Asn Leu Lys Ala Pro Ser Val  
675 680 685

Gln His  
690

<210> 198  
<211> 712  
<212> DNA  
<213> Lactuca sativa

<220>  
<221> misc feature  
<222> (608)..(608)  
<223> n is a, c, g, or t

<220>  
<221> misc feature  
<222> (656)..(656)  
<223> n is a, c, g, or t

<400> 198  
ttgttcagct ccgcaaaaag aatccaagaa ttggcgtaat ccggctcgat tcttattgtg 60  
aagggaccag gtgacataac ggggtggtgct tattagatct tccatgcatt tttcatggca 120  
tgatctttcg gtggattcag caaagttata gaaagcagat gaaacacgtc tcaagaaaac 180  
ttcatggcca cttaggaatt cgccttcttt ctgaagaaga taaacggaga tgggaagtaa 240  
tctcttgaga atgtgaagaa gtcgactgcc caactgatga agaaaagggtt caaaagtatc 300

acgagctttt gcaacagcga tgacacatgc agtcctggag taatttggtc catcatgaat	360
atcttcgacc ccacatgcat tcacaatttc ttcacgtgta attgcagggc attttatccc	420
tccaacaaca aacctaaatt cagccatggc acgatgatat tgtgcacctc catatagacg	480
catacctgca ttaggtatta gtttgtgtgg gaactgagag ccatcaatac cgattaatgc	540
ccctccatta accctctcat cttgtagtgt ttcccccatt ttatctggag gtgcaacaac	600
tgtccctntt catagcagtg ataacttggg aaggaaaaga tcatgaaaag atctcncttt	660
ctcctttagt ttgacttcat ctaaagtgtc gagttcttga tttatgtcat tt	712

<210> 199  
 <211> 666  
 <212> DNA  
 <213> *Medicago truncatula*

<220>  
 <221> misc feature  
 <222> (646)..(646)  
 <223> n is a, c, g, or t

<400> 199	
atctaaagta acaaccacca caaaacacaa caatggagga agaaagagaa caccaccaac	60
tcaaagacaa agaagaaaac gagtggcggtc tctacgaagc ttacaatgaa cttcacgcgc	120
ttgctcaaga acttcacacg cctttcgacg cgccggcggt actgggtgtg ggccacccaa	180
cagacgggaa gagcgctta gttgaggctc taatgggctt ccagttcaac cacgtcgggtg	240
gtggcaccaa aaccgcgcgg cccttactc ttcacatgaa atatggccca cattgcgagt	300
ctccttcttg ctatcttctt tctgatgatg acccttctct ttctcaccat atgtcacttt	360
cccaaattca ggggttatatt gaagctgaga atgcgagggt ggagcgtgac tcatgttgct	420
aattttcagc taaggaaata atcataaaag tggaatacaa atactgtccc aatctcacca	480
taatagacac accaggatta gttgctcctg caccaggctg taaaaatagg gcgatacagg	540
cacaggcacg agcggtagag tcaactggtc gtgcaaaaat gcagcacaag gagttcatta	600
tactctgtct tgaagattgt agtgattgga gcaatgcgac tacgangcgc gttgtaatgc	660
aaattg	666

<210> 200  
 <211> 663  
 <212> DNA  
 <213> *Medicago truncatula*

<400> 200	
gtctttatgg ggggtgcacaa tatcatcgag caatggctga atttcgtttt gtagttggag	60
gaatcaagtg ccctccaatt acccggaag aaattgtaaa tgcttgtgga gttgaagaca	120

ttcatgatgg aacaaactac tctaggactg cttgtgtaat tgctgttgca aaggctcatg	180
atacatttga accttttctt catcagttgg ggtctagatt gttgcacata cttaagagat	240
tgctcccaat ctctttttat cttcttcaga aagattgtga gtatctaagt ggccatcagg	300
tgttcctcag gcgtgttgcc tccgccttcg acaactttgc agaatccact gaaaaatcat	360
gccgtgaaaa atgtatggag gacttggtaa gcaccacacg atatgtctca tggctcttac	420
acaataagag tcgggcagga ttacgccagt tcttagattc atttggtgga acagaacatt	480
ccaatgtttg taatgatccc actgcaactg ttctatcaca aacaaatgtg caagagaagg	540
aagacacaaa gccacaacta gaagtaaagc tcagtcacgt ggcctctgga actgataccta	600
gcacatccac ccagacagct gaaacaaagc ttgctgacct tcttgatagt acactttgga	660
atc	663

<210> 201  
 <211> 622  
 <212> DNA  
 <213> *Prunus persica*

<220>  
 <221> misc\_feature  
 <222> (609)..(609)  
 <223> n is a, c, g, or t

<400> 201	
gcttataacct aacgcaggaa tgcgtttata tgggtggtgca caataccacc gtgccatggc	60
tgagttccgc tttgtagttg gaggaataaa atgccctcca attacaaggg aagaaattgt	120
aaatgcatgt ggagttgaag atttacatga tggcacaaac tactcaagga cagcttgtgt	180
aatagccgtt gcaaaggccc gtgatacatt tgagcctttc cttcatcagt taggtttag	240
actcttgcac attctaaaga gattacttcc tatatcagtc tatcttcttc agaaagatgg	300
tgagtattta agtggccatg aggtgtttct taggcgtggt gcttctgctt tcaatgactt	360
tgcagaatct accgaaaggg catgtcgtga aaaatgcatg gaggatttag taagcaccac	420
ccgctatgtc acctggtccc ttcacaacaa gaatcgagct gggttacgtc aatttttaga	480
ctcgttcgct ggaacagAAC ataacactat gggtagtaat tgcgtacctg ctggtatttc	540
ccaagattca tcctttgggt ctgttgccaa tgagaaggat actaagtcaa gggcagatgt	600
gaagctcanc catgtggcgt ct	622

<210> 202  
 <211> 752  
 <212> DNA  
 <213> *Solanum tuberosum*  
 <400> 202

gcgaatgtga ttcttcaaag gcaacaaagg ctgacggagg aatttgtgcc tcgtgcagat	60
ctgcttctgt ttctcatgtc tgctgatcga ccattaactg aaagtgaggt tagttttctg	120
cgttacactc agcagtggag taagaaggtc atttttgtgc tgaacaagtc tgacatatac	180
aagaataacg gcgagttgga ggaggccatt gcatttatca aagaaaatac acggaaattg	240
ctgaatacag aatccgtaac actgtatcca gtatctgcac ggctcgctct tgaatcaaag	300
ctttctactt ttgatgggtgc ccttagtcaa aacaatggga gttcaaataa tgattctcac	360
tggaaaacca agagcttcta tgagcttgag aagtacttgt ctagcttttt ggattcatcc	420
acaagtactg gaattgagag aatgaagctg aagcttgaaa ctccaattgc cattgcagaa	480
caactacttt tagcttgtca aggacttgtg agacaagaat gtcagcaagc caaacaagac	540
ttgctgtttg ttgaggatct tgtcaacagc gtagaagagt gcacaaagaa gctggaagtt	600
gatagcattc tgtggaagag gcaggttcta tctctgataa actctgctca agcacgtgtt	660
gtccggcttg tagagtcaac gttacaactg tcaaagtgtg atcttgtcgc tacatatgta	720
ttcagaagag aaaactctac tcaaatgcca gc	752

<210> 203  
 <211> 492  
 <212> DNA  
 <213> Glycine max

<400> 203	
tggtgaatga agctattgaa gctatcaaga gggctgcacc tctgatggag gaggtttcac	60
ttcttaatga tgcggtttct caaattgatg agccattctt actggttata gtgggggaat	120
tcaactctgg taaatctacc gtgattaatg cgcttcttgg agaaagatat ctcaaaggag	180
gagttgttcc aacaactaat gagatcacat ttttacgata tactgactta gatattgaac	240
aacaacggtg tgaaaggcat ccagatggcc aatatatttg ctacattcct gctccaattc	300
ttaaagagat gaccattgtt gatacacctg gaactaatgt gattcttcag aggcagcagc	360
gtcttacaga ggaatttgta ccccgtcag atttacttct ttttgtcatt tctgctgac	420
gccctttaac tggaagtgag attgcttttc ttcgttattc tcagcagtgg aaaaagaaag	480
cggtctttgt ct	492

<210> 204  
 <211> 446  
 <212> DNA  
 <213> Lycopersicon esculentum

<400> 204	
gagaccatta agtacaattc tataagcagt cttttgaaaa aagatggact tcattgggtga	60
atccgtctga ccaaattgag ttaggaacaa ctgggtgtgct ggatagaaaa tctgaagtta	120

ccataagtgt catagaggat ttcagtgtg cagctgtctt aaaattgctt gagagagata 180  
 ttcgtgaagt gttcttgggt acttttgggt gtcttggagc agctgggtta tcagcgtcgc 240  
 ttctgacatc tgttcttcaa accacattag aagacctcct tgcacttggc ctttgttctg 300  
 ctggcggggt attagcggtc ttcaacttct catcccgag acagcaagtg gtagataaag 360  
 taaagaggac tgctgatggc ctttcacgtg aactcgaaga ggctatgcag aaggagctct 420  
 tggagacgac tagtaatgtg gaggac 446

<210> 205  
 <211> 521  
 <212> DNA  
 <213> *Populus balsamifera* subsp. *trichocarpa*

<400> 205  
 tgggtgtgtg ctgtctgatc aagggttcc tgcccttggtg gcaagaaata tgatgatggg 60  
 ttctcgaact gaatcagttg ttctacctt ggtagccagg attgtgcaga caccatatgc 120  
 tgcattaaat gcgtctaatt ctgaagggtg tgattttctt atatatgttc atggcccaga 180  
 ggatgatcct gatgtagaaa tgagccctgg attcgggaat gtgaagatac caatctttgt 240  
 cctcaatgct tcacgtgggg aggacacatt gtcggtgggg gcatcaaaat ttctgaaaac 300  
 cggtgctagt ggtttagttc tgtcattgga agatttgagg ttatttagcg atgatgcttt 360  
 gagtcagatg tttgacactc tgagtgaac cggtaaaaac tttcaggatg accttgaaag 420  
 cttcagtaag ctcaaata tggatatgga aaatgatatt catgaaaaaa caacggtggc 480  
 aggctttgtt aaactggagg atagagaaaa acagctcata g 521

<210> 206  
 <211> 324  
 <212> PRT  
 <213> *Arabidopsis thaliana*

<400> 206

Met Glu Ala Leu Ser His Val Gly Ile Gly Leu Ser Pro Phe Gln Leu  
 1 5 10 15

Cys Arg Leu Pro Pro Ala Thr Thr Lys Leu Arg Arg Ser His Asn Thr  
 20 25 30

Ser Thr Thr Ile Cys Ser Ala Ser Lys Trp Ala Asp Arg Leu Leu Ser  
 35 40 45

Asp Phe Asn Phe Thr Ser Asp Ser Ser Ser Ser Ser Phe Ala Thr Ala  
 50 55 60

Thr Thr Thr Ala Thr Leu Val Ser Leu Pro Pro Ser Ile Asp Arg Pro



65		70		75		80
Glu Arg His Val	Pro 85	Ile Pro Ile Asp	Phe 90	Tyr Gln Val	Leu Gly 95	Ala
Gln Thr His	Phe 100	Leu Thr Asp Gly	Ile 105	Arg Arg Ala	Phe Glu 110	Ala Arg
Val Ser Lys	Pro 115	Pro Gln Phe Gly	Phe 120	Ser Asp Asp	Ala Leu 125	Ile Ser
Arg Arg Gln	Ile Leu 130	Gln Ala Ala Cys	Glu Thr 140	Leu Ser Asn	Pro Arg	
Ser Arg Arg	Glu Tyr 145	Asn Glu Gly	Leu Leu 155	Asp Asp Glu	Glu Ala 160	Thr
Val Ile Thr	Asp Val 165	Pro Trp Asp	Lys Val 170	Pro Gly Ala	Leu Cys 175	Val
Leu Gln Glu	Gly Gly 180	Glu Thr Glu	Ile Val 185	Leu Arg Val	Gly Glu 190	Ala
Leu Leu Lys	Glu Arg 195	Leu Pro Lys	Ser Phe 200	Lys Gln Asp	Val Val 205	Leu
Val Met Ala	Leu Ala 210	Phe Leu Asp	Val Ser 215	Arg Asp Ala	Met Ala 220	Leu
Asp Pro Pro	Asp Phe 225	Ile Thr Gly	Tyr Glu 230	Phe Val Glu	Glu Ala 235	Leu 240
Lys Leu Leu	Gln Glu 245	Glu Gly Ala	Ser Ser 250	Leu Ala Pro	Asp Leu 255	Arg
Ala Gln Ile	Asp Glu 260	Thr Leu Glu	Glu Ile 265	Thr Pro Arg	Tyr Val 270	Leu
Glu Leu Leu	Gly Leu 275	Pro Leu Gly	Asp Asp 280	Tyr Ala Ala	Lys Arg 285	Leu
Asn Gly Leu	Ser Gly 290	Val Arg Asn	Ile Leu 295	Trp Ser Val	Gly Gly 300	Gly
Gly Ala Ser	Ala Leu 305	Val Gly Gly	Leu Thr 310	Arg Glu Lys	Phe Met 315	Asn 320

Glu Ala Phe Leu ,